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Psychological Bulletin

EDITED BY

JOHN A. McGEOCH, WESLEYAN UNIVERSITY

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WALTER S. HUNTER, BROWN UNIVERSITY (*Psychol. Index*)

HERBERT S. LANGFELD, PRINCETON UNIV. (*Psychol. Rev.*)

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WITH THE CO-OPERATION OF

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MEETING OF THE AMERICAN PSYCHOLOGICAL
ASSOCIATION, INCORPORATED, HANOVER,
NEW HAMPSHIRE, SEPTEMBER 2, 3, 4, 5,
1936

REPORT OF THE SECRETARY, DONALD G. PATERSON,
UNIVERSITY OF MINNESOTA

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EDITED BY

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JOHN A. McGEOCH, WESLEYAN UNIVERSITY (*Bulletin*)
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PSYCHOLOGICAL REVIEW

containing original contributions only, appears bi-monthly, January, March, May, July, September, and November, the six numbers comprising a volume of about 540 pages.

PSYCHOLOGICAL BULLETIN

containing critical reviews of books and articles, psychological news and notes, university notices, and announcements, appears monthly (10 numbers), the annual volume comprising about 720 pages. Special issues of the BULLETIN consist of general reviews of recent work in some department of psychology.

JOURNAL OF EXPERIMENTAL PSYCHOLOGY

containing original contributions of an experimental character, appears bi-monthly, February, April, June, August, October, and December, the six numbers comprising a volume of about 900 pages.

PSYCHOLOGICAL INDEX

(Discontinued after No. 42, June, 1936)

is a compendious bibliography of books, monographs, and articles upon psychological and cognate topics that have appeared during the year. The INDEX has been published annually from 1895 to 1936, the volumes covering the literature of 1894 through 1935. Its bibliographical services will be carried on by the PSYCHOLOGICAL ABSTRACTS.

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THE
PSYCHOLOGICAL BULLETIN

PROCEEDINGS OF THE FORTY-FOURTH ANNUAL
MEETING OF THE AMERICAN PSYCHOLOGICAL
ASSOCIATION, INCORPORATED, HANOVER,
NEW HAMPSHIRE, SEPTEMBER 2, 3, 4, 5,
1936

REPORT OF THE SECRETARY, DONALD G. PATERSON,
UNIVERSITY OF MINNESOTA

The American Psychological Association, Inc., held its Forty-fourth Annual Meeting at Dartmouth College, Hanover, New Hampshire, on Wednesday, Thursday, Friday, and Saturday, September 2, 3, 4, and 5, 1936. A total of 851 persons registered, 191 of these being Members, 312 being Associate Members, 2 newly elected Members, 51 newly elected Associates, and 295 persons not affiliated with the Association. An analysis of the registration by geographical districts and states is as follows: New England States, 238 (Connecticut 74, Massachusetts 100, Rhode Island 18, New Hampshire 32, Maine 5, Vermont 9); Middle Atlantic States, 269 (New York 195, Pennsylvania 40, New Jersey 32, Delaware 2); South Atlantic States, 68 (District of Columbia 18, Maryland 14, Georgia 1, North Carolina 11, Florida 6, West Virginia 0, Virginia 14, South Carolina 4); East North Central States, 144 (Illinois 50, Indiana 4, Michigan 20, Ohio 63, Wisconsin 7); East South Central States, 29 (Kentucky 9, Tennessee 12, Mississippi 4, Louisiana 2, Alabama 2); West North Central States, 57 (Iowa 15, Kansas 1, Minnesota 31, Missouri 5, South Dakota 0, Nebraska 5, North Dakota 0); West South Central States, 9 (Arkansas 2, New Mexico 3, Texas 2, Oklahoma 2); Mountain States, 3 (Colorado 1, Wyoming 0, Arizona 0, Montana 0, Utah 2); Pacific States, 21 (California 17, Nevada 0, Oregon 2, Washington 2, Idaho 0); Foreign, 13 (Canada 7, Hawaii 2, Vienna 1, France 1, Switzerland 1, Porto Rico 1).

The program consisted of twenty-three sessions in which 143 of the 147 scheduled papers were presented by Members and Associates.

On Wednesday evening 12 research and instructional films were shown.

The Business Meeting of the Section of Clinical Psychology was held at 4:00 p.m. on Thursday at which time Dr. Gertrude Hildreth was elected Chairman of the Section for 1936-1937, and Dr. Edgar A. Doll was elected a member of the Executive Committee for the three year term 1936-1939. Three round tables of special interest to clinical psychologists were scheduled, one of which involved the panel discussion technique. Dr. Francis N. Maxfield was chairman of the panel discussion on "Substitute for the I.Q."; Dr. Florence Mateer was chairman of the round table on "Behavior and Endocrine Dysfunction"; and Dr. Clara Harrison Town was chairman of the round table on "Clinical Psychology and Social Work."

The Business Meeting of the Psychometric Society was held at 4:00 p.m. on Thursday at which time Dr. E. L. Thorndike was elected President for 1936-1937, Dr. Jack W. Dunlap was elected Secretary for 1936-1937, and Dr. Albert K. Kurtz was elected Treasurer for 1936-1937.

On Wednesday afternoon a round table on "Psychological Theory" was held with Dr. Robert S. Woodworth as chairman. Dr. Elmer K. Culler presented a forty minute paper on "Recent Advances in the Conception of the Conditioned Response." A panel discussion technique was utilized with discussion participants after which discussion was invited from the floor.

A round table on "The Subject Matter of Social Psychology" was held on Wednesday afternoon with Dr. Floyd H. Allport as chairman.

A panel discussion on "Qualifications of Industrial Psychologists" was held on Wednesday afternoon with Dr. Richard S. Uhrbrock as chairman.

A round table to discuss "In What Ways Can the Course in Educational Psychology be Made More Functional?" was held on Friday afternoon with Dr. D. A. Worcester as chairman.

A panel discussion on "Methodology in Learning" was held on Friday afternoon with Dr. Walter S. Hunter as chairman.

On Friday evening a general session of the entire Association was held in Webster Hall at which time Dr. Clark L. Hull delivered the Presidential Address, "Mind, Mechanism, and Adaptive

Behavior." At the conclusion of this general session Dartmouth College entertained members and guests in College Hall.

A small apparatus exhibit and book exhibit was held throughout the meeting in College Hall.

A meeting of the Council of Directors was called at 1:45 o'clock on Tuesday afternoon, September 1, and was adjourned at 12:43 A.M.

TRANSACTIONS OF THE ANNUAL BUSINESS MEETING

Due notice having been given the Annual Business Meeting of the American Psychological Association, Inc., a quorum being present, was held on September 3, 1936, in Room 105 Dartmouth, Dartmouth College, Hanover, New Hampshire, at 8:15 P.M., with President Hull in the chair.

Upon motion duly made and seconded it was voted that the minutes of the Forty-third Annual Meeting at the University of Michigan be approved as printed in the November, 1935, issue of the *PSYCHOLOGICAL BULLETIN*.

On recommendation of the Council of Directors it was voted to elect the six persons named below as Members:

1. Egon Brunswik	4. Norma Valentine Scheidemann
2. Wolfgang Köhler	5. David Segel
3. Gregory H. S. Razran	6. Philip Ewart Vernon

On the recommendation of the Council of Directors it was voted to transfer the thirty-seven Associates named below to the status of Member:

1. Donald K. Adams	20. William Evans McClure
2. Nancy Bayley	21. Fred McKinney
3. Robert Gibbon Bernreuter	22. Arthur W. Melton
4. Paul L. Boynton	23. Herbert Moore
5. Steuart Henderson Britt	24. Miles Murphy
6. Clarence W. Brown	25. Thomas Richards
7. Wm. Harold Cowley	26. Richard S. Schultz
8. Warren W. Coxe	27. Nathan W. Shock
9. Edward E. Cureton	28. Burrhus Frederic Skinner
10. Alvin C. Eurich	29. Madorah E. Smith
11. Karl C. Garrison	30. St. Clair A. Switzer
12. Calvin S. Hall	31. James Henry Taylor
13. Charles H. Honzik	32. C. W. Telford
14. Clarence V. Hudgins	33. John N. Washburne
15. William A. Hunt	34. George Richard Wendt
16. Richard Wellington Husband	35. M. M. White
17. Arthur Freeman Jenness	36. M. O. Wilson
18. Isadore Krechevsky	37. John B. Wolfe
19. Donald B. Lindsley	

On the recommendation of the Council of Directors it was voted to elect as Associates the 199 persons whose names appear below:

1. Ruth Helene Abells
2. Daniel Leslie Adler
3. Heinz Ansbacher
4. Sette Arsenian
5. John Bayne Ascham
6. Donald Everett Baier
7. Lynn E. Baker
8. Joseph Ephraim Barmack
9. Frank Ambrose Beach II
10. Frederick Kenneth Berrien
11. Harry Voorhies Bice
12. Aubrey Woodruff Bickley
13. Benjamin Samuel Bloom
14. John Marius Bly
15. Joseph M. Bobbitt
16. Joseph Samuel Anselme Bois
17. Mary Marjorie Bolles
18. Pearl Brand
19. Hyman Brandt
20. Lily Brunschwig
21. B. Richard Bugelski
22. Claude E. Buxton
23. John Spencer Carlson
24. James O. Castiello
25. Eleanor Alice Chapman
26. Isidor Chein
27. Irvin L. Child
28. Charles Samuel Clucas
29. Harold Coe Coffman
30. Stuart Wellford Cook
31. John H. Cooper
32. Philip Garner Corby
33. Jean Leslie Cornett
34. Clarke Winslow Crannell
35. Samuel Billings Cummings, Jr.
36. Donald Harold Dabelstein
37. Ralph P. Darling
38. Cora Elisabeth DeBoer
39. Edmund Burke Delabarre, Jr.
40. Tamara Dembo
41. Laurent Deshaies
42. Nathan Dessotnekoff
43. Mervin A. Durea
44. Oran Wendle Eagleson
45. Lowell Milton Ebel
46. Philip Eisenberg
47. Douglas G. Ellson
48. Earle Edward Emme
49. Stanley Goddard Estes
50. Dorothea Wood Fogle Ewers
51. Ray Faulkner
52. Paul Fendrick
53. John Lincoln Finan
54. Paul Morris Fitts, Jr.
55. Marian Josephine Fitz-Simons
56. Frank Milford Fletcher, Jr.
57. Norman Oliver Frederiksen
58. Albert Daniel Freiberg
59. Sylvia Frumkin
60. Annette L. Gillette
61. Samuel Goldberg
62. Kurt Goldstein
63. Louis Granich
64. Wilbur Smith Gregory
65. Walter F. Grether
66. Margaret M. Halleran
67. Nelson Gilbert Hanawalt
68. Gertrude Aby Hanchett
69. Lucien Mason Hanks, Jr.
70. Royal Stillman Hayward
71. Donald Olding Hebb
72. Harry Walker Hepner
73. Virgil E. Herrick
74. Max Hertzman
75. Beverley Eli Holaday
76. Marian Bellamy Hubbell
77. Margaret Ives
78. Joseph Florian Jastak
79. Martin David Jenkins
80. Hiram Kellogg Johnson
81. Mildred M. Judge
82. Polyxenie Kambouropoulou
83. Robert Crane Kammerer
84. Margaret E. Keller
85. Noble Henry Kelley
86. Bruno Klopfer
87. Harry Frank Koob
88. Theophile Stanley Krawiec
89. Abraham Kroll

90. Joseph Francis Kubis
91. Leonora Carrington Lane
92. Mary Lasater
93. Gerald William Lawlor
94. Paul Felix Lazarsfeld
95. George Frederick John Lehner
96. Andrew Leitch
97. Richard Henry Leukart
98. Sidney Lewine
99. Annette Lucille Lewis
100. Maurice Lichtenstein
101. Hazel Lincoln
102. Janet Lines
103. Frederick George Livingood
104. Louis Long
105. Mathias B. Lynaugh
106. Keith MacKane
107. Winifred Katherine Magd-sick
108. Donald Roger Mallett
109. Samuel Marowitz
110. John Rogers Martin
111. Katharine E. McBride
112. John William McGarvey
113. Kathryn McHale
114. Frances Davis McTeer
115. Margaret Mercer
116. Marjorie H. Miles
117. Joseph Ernest Moore
118. Genevieve Hellene Morris
119. Nelson Whitman Morton
120. Charles J. Mosier
121. Aaron B. Nadel
122. Joseph Garton Needham
123. Stanley Donald Noble
124. Herbert F. Osborne
125. Charles Robert Pace
126. Eleanor M. Palmer
127. Joseph H. Pataky
128. Leigh Peck
129. Luigi Petrullo
130. Caryl Cody Pfanzichl
131. Wendell Sharman Phillips
132. Ruth Wadsworth Poindexter
133. Gladys E. Poole
134. Margaret Sidney Quayle
135. Frederick Leonard Reinwald
136. Ryah B. Reisley
137. Alice M. Reph
138. Melvin Gillison Rigg
139. John Riley Roberts
140. Carl R. Rogers
141. Victor Rosenfield
142. John Watson Murray Roth-ney
143. Lawrence Rubenstein
144. Olga Rubinow
145. David Garriott Ryans
146. Beulah Helen Sampson
147. Barkev S. Sanders
148. Benjamin Richard Schaefer
149. Martin W. Schaul
150. John B. Schoolland
151. William Aldrete Benton Schrader
152. Clifford Ellsworth Scott
153. Margaret Aline Seder
154. Geraldine F. Seiler
155. Clifford P. Seitz
156. Agnes Arminda Sharp
157. Robert Wilson Shaw
158. Herbert Shuey
159. Jeannette Skladman
160. Douglas E. Smith
161. J. Mapheus Smith
162. Bernard Sobel
163. Frances Selkin Sobel
164. George Scott Speer
165. Morris Speevack
166. Howard Davis Spoerl
167. Max Davis Steer
168. Edward I. Strongin
169. J. Ridley Stroop
170. Dewey Bernard Stuit
171. Franklin V. Taylor
172. Robert Sydney Thompson
173. William A. Thomson
174. Andrew Triche
175. Evelyn Troup
176. Henry Teller Tyler
177. Ethel Virginia Van Dyne
178. Neil Jacob Frederik Van Steenberg
179. Mary C. Van Tuyl
180. Ruth Selma Vendig
181. Guy W. Wadsworth, Jr.

182. Sebon Rains Wallace, Jr.	192. S. Jean Wolf
183. Gene A. Wallar	193. Paul Dean Woodring
184. John Warkentin	194. Herbert Fletcher Wright
185. Ruth M. Warnke	195. Ruth F. Wyatt
186. Edward Clark Webster	196. Hugh Chalmers Wyland
187. Henry J. Wegrocki	197. George Kassimer Yaczynski
188. Henry Huges Welch	
189. Regina Westcott Wieman	198. J. Willard Yoder
190. Clarence Farman Willey	199. George Kingsley Zipf
191. Herman A. Witkin	

The Secretary announced the deaths of the following Members: John P. Hylan, August 30, 1935; Melvin Albert Martin, March 27, 1936; Joseph Peterson, September 20, 1935; and Henry E. Starr, November 2, 1935; and the following five Associates: Herman M. Adler, December 6, 1935; Lotta M. Karpeles, September 15, 1935; Siegfried E. Katz, December 14, 1935; Frank Charles Touton, June 1, 1936; and Evelyn M. Warnke, January 21, 1936.

The Secretary announced the resignation of the following seven Members: Edward Scribner Ames, Lewis O. Anderson, Will Grant Chambers, A. S. Edwards, Arthur S. Otis, W. M. Wheeler and Mildred E. Sheetz Wolfenden.

The Secretary announced the resignation of the following thirty-four Associate Members: Mary E. Adams, Cecelia G. Aldrich, Sarah Wood Buchanan, Lola Marion Crandall, Lawrence E. Eberly, John Arthur Glaze, Clyde W. Gleason, Ingvald B. Hauge, Ernest H. Henrikson, R. Yorke Herren, Rex Livingstone Hoke, Inez Invaline Ireland, Kenneth H. Lanouette, George Albert Lewis, Dorothy Sydney Loeb, Frederick Hillis Lumley, Lydia E. MacKnight, Ellen Alice McAnulty, Edna Howell McKnight, Mary Lucille Mercer, Mary Broughton Small Millard, George Rex Mursell, Willard E. Parker, Joseph Pessin, Lloyd E. Rackley, Roy L. Roberts, Ruth Mazer Simon, Magda Skalet Skeel, Wiley F. Smith, Alto L. Snell, Edward Marvin Twitmyer, Leonard B. Wheat, Harold M. Williams, Minchi Young.

The Secretary announced the transfer of the following Member to Associateship: Wallace Craig.

On the recommendation of the Council of Directors the Association voted to appoint a Committee to Consider the Desirability of Formulating By-Laws for Establishing an Honorary Membership Classification to consist of John E. Anderson, Chairman, E. S. Robinson, and Leonard Carmichael as members.

The Secretary announced that the Council of Directors had

approved reports of financial status of the *Psychological Abstracts*, the Psychological Review Co., and the *Journal of Abnormal and Social Psychology* for 1935 as printed in the March issue of the PSYCHOLOGICAL BULLETIN.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee on Securing Financial Support for the Continuation of *Psychological Abstracts*, ordered the report printed in the Proceedings, and to continue the Committee for 1936-1937. See Reports.

On the recommendation of the Council of Directors the Association voted to appoint a Committee to Study the Problem of Costs of Continuing the *Psychological Abstracts* for the Next Ten Years consisting of R. S. Woodworth as Chairman, the retiring Treasurer, the Treasurer, the Editor of *Psychological Abstracts*, the Business Editor of the Review Publications, and A. T. Poffenberger, and instructed the Committee to submit a comprehensive report with recommendations to the 1937 Annual Business Meeting. The Council suggested the presentation of annual budgets on the present scale of operations and on reduced scales of operation.

The report of the Committee on the Election of Officers was then presented as follows:

President for 1936-1937: Edward Chace Tolman, University of California.

Directors for 1937-1939: Gordon W. Allport, Harvard University, and John A. McGeoch, Wesleyan University.

Nominees for appointment to the Division of Anthropology and Psychology of the National Research Council: Henry E. Garrett, Columbia University; Arnold Gesell, Yale University; and Calvin P. Stone, Stanford University.

Representative on the Social Science Research Council: Mark A. May, Yale University.

On the unanimous recommendation of the Council of Directors it was voted to elect Willard L. Valentine of Ohio State University as Treasurer for the term 1936-1939.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Program Committee, to order the report printed in the Proceedings, and to authorize the Secretary to take a mail ballot of the entire membership to obtain an expression of opinion regarding program making policies. See Reports.

The Secretary announced that the Council of Directors has

appointed Florence L. Goodenough of the University of Minnesota, Herbert Woodrow of the University of Illinois, and the Secretary as the Program Committee for 1937.

The Secretary announced that the Council of Directors unanimously approved the actions of the President in making the following appointments:

(a) Dr. Madison Bentley of Cornell University to act as a representative of the American Psychological Association at the inauguration of William Sumner Appleton Pott as President of Elmira College on October 26, 1935;

(b) Dr. Floyd H. Allport of Syracuse University to act as a representative of the American Psychological Association at the inauguration of Alan Valentine as President of the University of Rochester on November 15, 1935;

(c) Dr. Edwin B. Twitmyer of the University of Pennsylvania to act as a representative of the American Psychological Association at the celebration of the Fiftieth Anniversary of the Founding of Bryn Mawr College which was held on November 1 and 2, 1935;

(d) Dr. Samuel W. Fernberger of the University of Pennsylvania to act as a representative of the American Psychological Association at the inauguration of John Ahlum Schaeffer as President of Franklin and Marshall College on December 6, 1935;

(e) Dr. Herbert R. Laslett of Oregon State Agricultural College to act as a representative of the American Psychological Association at the inauguration of C. Valentine Boyer as President of the University of Oregon on February 6, 1936;

(f) Dr. Roy M. Dorcus of Johns Hopkins University to act as a representative of the American Psychological Association at the inauguration of Fred Garrigus Holloway as President of Western Maryland College on April 25, 1936; and

(g) Dr. Forrest L. Dimmick of Hobart College to act as a representative of the American Psychological Association at the celebration of the One Hundredth Anniversary of the Founding of Alfred University which was held on June 6 to 12, 1936.

On the recommendation of the Council of Directors the Association voted unanimously to accept the invitation from the Department of Psychology of the University of Minnesota, Minneapolis, Minnesota, to hold the Forty-fifth Annual Meeting at Minneapolis on September 1, 2, 3, and 4, 1937, and appointed Richard M. Elliott as a member of the Executive Committee for 1936-1937.

On the recommendation of the Council of Directors the Asso-

ciation voted to authorize the Council of Directors to schedule meetings for two or more years in advance.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee on Precautions in Animal Experimentation and ordered the report printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association elected Donald K. Adams of Duke University as a member of the Committee on Precautions in Animal Experimentation for the term 1936-1939.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee on Psychology of the National Advisory Council on Radio in Education and ordered the report printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association voted to continue during 1936-1939 the Committee on Psychology of the National Advisory Council on Radio in Education with W. V. Bingham as Chairman, Goodwin B. Watson, Hadley Cantril, and Gordon W. Allport as members.

On the recommendation of the Council of Directors the Association voted to accept the invitation of the First National Conference on Educational Broadcasting to participate in the Conference and authorized the Chairman of the Committee on Psychology of the National Advisory Council on Radio in Education to attend the Conference on December 10, 11, and 12, 1936, as the official delegate of the American Psychological Association.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the representatives on the Social Science Research Council and ordered the report printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association voted to make the following changes in the By-Laws in order to bring the By-Laws into harmony with the changed procedure for electing representatives of constituent societies to the Social Science Research Council: Article VI, Section 2, is hereby amended by eliminating the following words, "and for representatives of the Association on the Social Science Research Council" from the third and fourth lines of Section 2; eliminating "and the Social Science Research Council" from the tenth line of Section 2; and adding Section 3 to Article VI to read as follows: "The names of Members submitted by the Executive Committee of the Social Science

Research Council shall be printed upon the election ballots and election shall be by means of a preferential voting system. The name of the Member thus nominated by vote of the Association shall be presented to the Social Science Research Council as the Association's nomination for its representative."

The Secretary announced that an informal report had been received from the Association's representatives on the Council of the American Association for the Advancement of Science indicating that our representatives had attended the Council meeting and had duly performed their duties in connection therewith.

On the recommendation of the Council of Directors the Association voted to appoint Walter R. Miles of Yale University and Christian A. Ruckmick of the University of Iowa as representatives of the American Psychological Association on the Council of the American Association for the Advancement of Science for 1937.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the delegates to the Inter-Society Color Council, ordered the report printed in the Proceedings, and ordered continuance of affiliation with the Inter-Society Color Council for 1936-1937. See Reports.

On the recommendation of the Council of Directors the Association voted to reappoint our voting delegates and additional delegates to the Inter-Society Color Council for the term 1936-1937.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee on Motion Pictures and Sound Recording Devices in Instruction of Psychology, to order the report printed in the Proceedings, and to continue the Committee with its membership unchanged except that Edgar A. Doll is to assume the Chairmanship. See Reports.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee on the Experimental Study of Suggestion, to order the report printed in the Proceedings, and to discontinue the Committee. See Reports.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report from Herbert Woodrow regarding the activities of the Division of Anthropology and Psychology of the National Research Council and ordered the report printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee on the Social Utilization of Unemployed Psychologists, to order the

report printed in the Proceedings, and to discontinue the Committee. See Reports.

President Hull announced that a proposal had been received from the Psychologists' League requesting that the Association endorse a W.P.A. project drawn up by the Psychologists' League to provide for a National Consultation Bureau which would utilize the services of a large number of unemployed psychologists, etc. The Secretary presented the gist of the proposal and a representative from the Psychologists' League was given the floor to explain the proposal in detail. After considerable discussion the following action was taken: "On the recommendation of the Council of Directors the Association voted to authorize the Council of Directors to appoint two Senior Members of the Association to represent the American Psychological Association in collaborating with the Psychologists' League and the Association of Consulting Psychologists, to consider the feasibility of working out ways and means of increasing the opportunities for psychological service in education, government, social service and business and industry." The vote of the Association also included the following instruction: "In the event that proposed actions of the joint-committee should involve any commitments of the American Psychological Association, the American Psychological Association representatives shall confer with the President and Secretary who are instructed to approve the commitments or, at their discretion, to secure a vote of the Council of Directors, or of the Members of the Association."

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee on Psychology and the Public Service, to order the report printed in the Proceedings, and to continue the Committee. See Reports.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee to Consider the Reorganization of the Association in Relation to Regional Branches and Regional Meetings, to order the report printed in the Proceedings, and to discontinue the Committee. See Reports.

On the recommendation of the Council of Directors the Association voted to adopt the Secretary's report on Affiliation of National, Regional, and Local Organizations including the proposed changes in the By-Laws with the proviso that the status of existing national, regional, and local branches and affiliates be continued

unchanged, and to order the report printed in the Proceedings. See Reports.

A motion by Herbert W. Rogers that Section 2-a in regard to the responsibility of the Association for the administration and the financial affairs of any affiliate be deleted was lost for want of a second.

The Secretary announced that the Council of Directors has received petitions for affiliation from the Association of Consulting Psychologists and from the Society for the Psychological Study of Social Issues and that these petitions will be acted upon at the Forty-fifth Annual Business Meeting of the Association. Dr. Gertrude Hildreth, President of the Association of Consulting Psychologists, and Dr. I. Krechevsky, Secretary-Treasurer of the Society for the Psychological Study of Social Issues were given the floor to describe the purposes of their respective organizations and to answer questions from the Members present. See Reports for copies of the petitions.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee to Study Problems Connected with the Teaching of Psychology in High Schools and Junior Colleges, to order the report printed in the Proceedings, to continue the Committee during 1936-1937, and authorized the Treasurer to budget a sum not to exceed \$150.00 for the expenses of conducting its proposed canvass. See Reports.

On the recommendation of the Council of Directors the Association voted to adopt the report of the Committee on the Relation of the Association to its Publications including the proposed changes in the By-Laws, ordered the report printed in the Proceedings, thanked the Committee for its services, and voted to discontinue the Committee. See Reports.

On the recommendation of the Council of Directors the Association voted to adopt the report of the Committee to Study the Costs of Conducting the Affairs of the American Psychological Association as now Operated and to Make Estimates of Probable Costs of other Modes of Organization, to order the report printed in the Proceedings, and to continue the Committee without change in its personnel. See Reports.

The following resolution was presented for the consideration of the Association:

"WHEREAS the members of the Council of Directors of the American Psychological Association have investigated the feasibility of the 12-month equal-quarter plan known as the World

Calendar and believe that it is a practical solution; be it therefore

"RESOLVED that the American Psychological Association hereby approves the 12-month equal-quarter plan for the simplification of the calendar and hereby instructs its Secretary to communicate this action to the World Calendar Association, Inc."

After brief discussion the Association voted to lay the resolution on the table.

On the recommendation of the Council of Directors the Association voted to accept the invitation from the National Occupational Conference to have the American Psychological Association appoint a representative to serve on the membership of the National Occupational Conference and voted to appoint Dr. Percival M. Symonds of Columbia University as our representative for the three year term 1936-1939.

On the recommendation of the Council of Directors the Association voted to accept the invitation for representation on the Sectional Committee on Standards for Graphic Presentation of the American Standards Association and voted to appoint William A. McCall of Columbia University as representative.

On the recommendation of the Council of Directors the Association voted to accept the invitation of the New York Management Council to participate in the New York Management Council providing no financial obligations are to be assumed by the American Psychological Association, and voted to appoint A. T. Poffenberger as representative on the New York Management Council Board of Directors.

The following recommendation from the Board of Editors was presented to the Association: "That the Editors recommend to the Council of Directors of the American Psychological Association, Inc., that, with the volume beginning in the summer of 1937, the older name of the *Journal of Abnormal and Social Psychology*, namely, *The Journal of Abnormal Psychology*, be restored and that the field covered by this journal shall conform to its changed title."

On the recommendation of the Council of Directors the Association voted to lay on the table the recommendation of the Board of Editors concerning a change in title and scope of the *Journal of Abnormal and Social Psychology*.

On the recommendation of the Council of Directors the Association voted to approve the Treasurer's report for 1935-1936 as published in the March issue of the PSYCHOLOGICAL BULLETIN and the Treasurer's Budget for 1936-1937. See Reports..

On the recommendation of the Council of Directors the Association voted to approve the action of the New York Branch of the American Psychological Association at its annual business meeting on April 8, 1936, in changing the name "New York Branch of the American Psychological Association" to "Eastern Branch of the American Psychological Association."

The following motion by Dr. Harold E. Burtt having been duly seconded was passed unanimously: That a Committee consisting of Richard S. Uhrbrock, Chairman, Rensis Likert, and Lorin A. Thompson, Jr., as members be appointed to study the qualifications of industrial psychologists and to formulate specifications for training and internship for the guidance of persons contemplating a career in this field.

Upon motion duly made and seconded it was voted officially to express the thanks of the Association to the members of the Department of Psychology of Dartmouth College, to President Ernest M. Hopkins, and to other officers and members of Dartmouth College for the excellent arrangements provided for the Forty-fourth Annual Meeting of the American Psychological Association.

The meeting adjourned at 11:34 P.M.

REPORT OF THE COMMITTEE ON SECURING FINANCIAL SUPPORT FOR
THE CONTINUATION OF THE PSYCHOLOGICAL ABSTRACTS

August 18, 1936.

On behalf of the Committee on the Continuation of the *Psychological Abstracts* I wish at this time to make a report of progress.

Your Committee, after holding two meetings, one in Worcester and one in New York, and after careful study of the matter, drew up a statement of the financial needs and prospective resources of *Psychological Abstracts*, and has thus far submitted this statement to one Foundation, but without positive results. We wish, however, to continue our efforts, and we believe it is safe to recommend to the Association that it proceed on the assumption that the *Abstracts* can be continued.

We accordingly request that the Committee be continued.

R. S. WOODWORTH, Chairman

REPORT OF THE PROGRAM COMMITTEE OF THE AMERICAN
PSYCHOLOGICAL ASSOCIATION, 1936

August 10, 1936.

To the Council of Directors and the Members of the American Psychological Association:

GENTLEMEN: There were 188 abstracts (including three alternate abstracts) submitted for the 1936 program. The following disposition was made of these papers: 149 were accepted of which two were withdrawn after acceptance. One paper was rejected because the author is not a member of the Association. Four abstracts were returned because each of the authors had submitted an abstract on another topic. Seven abstracts were rejected because they were received too late. A total of 24 abstracts was rejected for other reasons. Three alternate abstracts were returned.

The Committee scheduled the 147 papers in 23 sectional meetings. In addition, 12 research and instructional films were scheduled at a special evening session. In view of the large number of worthy abstracts submitted and accepted the Program Committee had difficulty in keeping the number of papers per section within reasonable limits and at the same time keeping the number of simultaneous sections at a minimum in the seven half days available. It was necessary to schedule four simultaneous sections on two of the half days.

The total membership in the Association as well as the number of abstracts submitted each year will undoubtedly continue to grow. It is obvious, therefore, that crowded schedules at future annual meetings will be hard to avoid. Because of this trend, it seems desirable that some expression of views by the Association on program making be secured. The Committee does not have any definite recommendations. It does feel, however, that the number of papers in any one section should be kept at not more than six if possible. As a basis for discussion various possible changes that might alleviate the situation are listed below:

1. Four simultaneous sections might be scheduled on each half day. These could be staggered to some degree.
2. Sections could be scheduled for Saturday afternoon. This was not popular when tried in 1932.
3. More days might be added to the meeting. The papers could be grouped so that the person interested in a certain field such as animal, applied, or abnormal, would find all papers on this subject

scheduled within a two day period. Hence it would not be necessary to remain throughout the meeting.

4. There might be an arbitrary selection of papers to keep the total number accepted within a specified limit.

The Committee suggests that in the future the call for papers should require an author to submit either a 10 or a 15 minute report, not both. It is felt that the author is better fitted than the Committee to decide on the best length of his report.

The Committee wishes to thank the membership for submitting abstracts with due regard to the rules and regulations. This greatly facilitated the making of the program.

Respectfully submitted,

DONALD G. PATERSON

JOY PAUL GUILFORD

MILES A. TINKER, *Chairman*

REPORT OF COMMITTEE ON PRECAUTIONS IN ANIMAL
EXPERIMENTATION

July 23, 1936.

To the Council of Directors of the American Psychological Association:

GENTLEMEN: As in previous years, Dr. William C. Woodward, Director of Legal Medicine and Legislation of the American Medical Association, has notified your Committee of bills introduced in legislative assemblies designed to prevent or restrict use of animals in scientific experiments. During the current year only one such measure has come to the attention of your Committee: New York Assembly Bill A-83. Letters were sent to department heads and animal psychologists in New York urging them to petition their proper representatives against enactment of this bill into law.

Although there has been a marked decrease during the past two years in activities which endanger legitimate animal experimentation, your Committee believes that uninterrupted vigilance and prompt action as indicated are essential as safeguards for the continuance of unhampered research of this type.

ELMER K. CULLER

NORMAN L. MUNN

HENRY W. NISSEN, *Chairman*

REPORT OF THE COMMITTEE ON PSYCHOLOGY OF THE NATIONAL
ADVISORY COUNCIL ON RADIO IN EDUCATION

July 17, 1936.

To the American Psychological Association:

During the current year your Committee on the Broadcasting of Psychology has answered a number of inquiries, and authorized the re-broadcasting, from local educational stations, of the addresses on "Psychology Today" given in 1932 over a nation-wide chain. This re-broadcasting is now in progress from an educational station in Western Canada.

It is suggested that the Committee be continued under a new Chairman and with some change of membership.

W. V. BINGHAM, *Chairman*

REPORT OF THE REPRESENTATIVES ON THE SOCIAL SCIENCE
RESEARCH COUNCIL

August 12, 1936.

Among the decisions and activities of the S.S.R.C. during 1935-1936, two need to be drawn to the attention of our Association. (1) The best method of choosing representatives from the seven constituent societies to membership in the Social Science Research Council has been discussed for several years, and various plans have been tried out by the Council. The methods of the seven societies have differed in some details, and it is obvious that the members from some of the Societies have genuinely represented their constituent bodies, while the members from other societies do not appear to do so. Election is often on the basis of general familiarity with the names of research scholars, not all in terms of their individual interest in the work of the Council or desire to give time and energy to studying its problems. The election to the Council is thus looked upon perhaps as an honor, but not as a sentence to hard labor (which in fact it should be). While not altogether deplored the honorific function which is served in this way, the Council has had to admit much gross inefficiency, such as hasty or uninformed action on important technical research projects, including the ratification of large sums for such projects. The Executive Director has constantly sought to get more active participation in Council work, full attendance at all meetings, and, above all, active discussion. After mature

consideration, the Council voted in September, 1935, to ratify a plan by which the membership of each constituent society would choose three members from a panel submitted to them by the S.S.R.C., this panel consisting of individuals actively interested in social science research and considered to be large potential assets in the actual functioning of the Council. This new plan was submitted to the seven societies and no dissent was expressed in any quarter. The plan is therefore in effect. The membership of the American Psychological Association is respectfully, but very urgently, asked to consider very closely the importance of choosing from each year's panel individuals whom they consider likely to coöperate closely and energetically in advancing research on the most pressing and significant problems in the social sciences.

(2) In view of the obvious impossibility of stimulating research on every promising problem, the Council has for some years experimented with intensive work on special "areas of concentration." Sometimes these areas lie *within* a given academic discipline; sometimes they are *inter-disciplinary*, requiring collaboration from two or more groups. Such an area continuously under consideration since 1930 is "Personality and Culture." Partly because the terms were left undefined and the field of research not clearly delimited, it took a long time to get under way. A proposal in 1934 by a special committee outlined a series of large-scale research projects, which in the opinion of the Committee on Problems and Policy could not be financed. An entirely different plan of procedure was therefore set up involving: (a) a systematic survey of research work already done on specific aspects of the problem of the relation of personality to culture; (b) the drawing up of a number of specific further projects which would "fill in gaps and advance the frontier," thus contributing to the "organic growth of knowledge." Instead of a large heterogeneous committee, it was felt desirable to make use of several small sub-committees, each homogeneous in general aim, collaborating as closely as each topic of inquiry permitted. A sub-committee of Anthropologists decided to choose "acculturation" as a field for intensive work within the general area of Personality and Culture, and a sub-committee of Sociologists decided to work on "delinquency." Both have been at work and have reported progress; both are using research methods and concepts which reflect genuine interdisciplinary approaches and overlap largely upon social psychology. The sub-committee of Psychologists, Gordon W. Allport, Gardner Murphy, and Mark A. May, Chairman, has worked for nearly two

years on the problem of "competitive and coöperative habits," undertaking to study how and for what goals individuals compete and coöperate, what external forms and underlying motives can be defined and what degree of plasticity "human nature" shows under various conditions and as a reflection of individual differences of many sorts. A group of research assistants worked with this sub-committee, surveying the literature and offering systematic interpretations in each of the following seven fields:

1. Competitive and coöperative habits in primitive cultures.
2. Competitive and coöperative habits in childhood in our own culture.
3. Experimental and quantitative studies of these habits in adults.
4. Life-history documents in relation to competitive and coöperative habits.
5. Sociological studies of institutions which foster competition and coöperation.
6. In the economic sphere, the analysis of "coöperatives," especially the reasons for their successes and failures.
7. Competition and coöperation in Soviet Russia.

Utilizing this material, a long report has been drawn up by the psychological sub-committee, emphasizing what we know and what we do not know about competitive and coöperative habits and their motivation, and proposing a long list of research projects capable of inter-disciplinary attack. This report, still in rough draft, is being put into final form by the chairman, Mr. May. Though this sub-committee appears to have completed its assigned task, the fact that Mr. May is also the Chairman of the Personality and Culture Committee as a whole will insure continuance of psychological collaboration for some time. The practical test is of course the question whether this method of mapping a field and planning an integrated attack can actually stimulate crucial research, and this is for the future to show. The psychologists who served on this sub-committee found that the huge expenditure of time was rewarded by a very great increase of insight into the problems of other social scientists, and the means of collaborating with them, and hope that their published report will help to convey the reasons for their belief in the importance of inter-disciplinary research.

ALBERT T. POFFENBERGER
GORDON W. ALLPORT
GARDNER MURPHY

REPORT OF THE DELEGATES OF THE AMERICAN PSYCHOLOGICAL
ASSOCIATION TO THE INTER-SOCIETY COLOR COUNCIL
FOR 1935-1936

July 6, 1936.

1. Activities of the Inter-Society Color Council

Under its new articles of organization and by-laws, the I.S.C.C. has continued its activities with increasing vigor. A considerable number of commercial organizations who are not eligible to active membership have taken advantage of the opportunity to affiliate through individual associate memberships. This already is increasing the scope of the Council's activities by bringing to it new problems and wider recognition of its activities and influence.

The problem in regard to the accurate designation of colors which was presented by the U. S. Pharmacopoeia has been handled to the satisfaction of that group, and the recommendations of the Council have been accepted and acted upon.

Appeals for assistance with color problems have been so numerous that the Council has appointed Dr. Judd of the National Bureau of Standards to take charge of allocating problems for solution. One major activity now in progress is a compilation of color terms, color problems and color tests. It is obvious that every color problem must lead into physics, physiology, psychology, and practice; yet these fields have only the slightest common ground of terminology. Dr. Judd's committee is endeavoring to bring the various accredited usages together with the view of making the several fields intelligible to one another and perhaps unifying the terminology of color. Another project which is in the hands of a special committee is the compilation of a "Who's Who in Color." The value of such a directory can readily be understood.

We should like to call to the attention of the Association that the Council does not generate its own problems. Rather it attempts to assist its members who have problems in color and we wish to urge, therefore, that if any members of the American Psychological Association have such problems they should communicate them to one of the official delegates.

At its regular meeting in February, the I.S.C.C. sponsored a group of lectures on color, to which all members of Member Bodies were invited. The lectures were well received and similar ones are projected for the future. In order to increase the number of people

directly involved in the activities of the Council, regional meetings of persons interested in color are now being sponsored.

The News Letter has been continued and improved in context and format.

2. Activities of the American Psychological Association Delegates

Your delegates have taken an appropriate part in the activities of the I.S.C.C. The chairman is serving as a director on the executive committee; five delegates are acting as a sub-committee in the compilation of color terms, problems and tests with special reference to psychology; another delegate represents psychology on the committee that is preparing the "Who's Who in Color."

Your delegates recommend to the Association that membership in the I.S.C.C. be continued.

Respectfully submitted,

SIDNEY M. NEWHALL

MICHAEL J. ZIGLER

FORREST L. DIMMICK, *Chairman*

REPORT OF COMMITTEE ON MOTION PICTURES AND SOUND RECORDING DEVICES IN INSTRUCTION OF PSYCHOLOGY

August 15, 1936.

Last year your Committee was able to report that abstracts for 35 psychology films had been prepared and submitted to Editor W. S. Hunter for publication in *Psychological Abstracts*. Work along this same line has been continued during the current year. Abstracts for a total of about 50 films have now been published. These are of easy reference through the index numbers of *Psychological Abstracts*, and are meeting the general need for information about films in psychology.

The Committee is well aware that there are quite a number of psychology films in existence that are still unabridged. However, this responsibility must rest on the shoulders of the film producers. If a film is not of such quality that the author wishes to have it duplicated for sale, or if the author has not had opportunity properly to edit and title the film, then obviously it should not be abridged and advertised for rental or sale. It remains in a somewhat similar status as an unpublished doctor's dissertation. If the film subject is an interesting one and the portrayal effective, all the Committee or other psychologists can do is to urge the author to finish his job and

make the carefully prepared result available to his psychological colleagues. Your Committee would suggest that it is no longer necessary that film abstracts pass through their hands. These should now be submitted to Editor W. S. Hunter.

A review and critique of the existing films in psychology is now in process of preparation by Dr. Lester F. Beck of the University of Oregon, who is sparing no effort to make this review as complete as possible. It is hoped that this film digest may be published in the *Psychological Bulletin*.

During the current year, the American Council on Education has set up the American Film Institute, whose main function, according to announcements, will be to advance education by the use of the motion picture and other allied visual-auditory aids in all fields of learning. This Institute is undertaking the collection and distribution of specific information concerning motion pictures in education in the effort to stimulate the production and use of motion pictures for educational purposes. Your Committee is endeavoring to coöperate with this Institute, and has supplied them with complete abstracts of all psychology films thus far published.

Respectfully submitted,

E. A. DOLL
P. S. ACHILLES
W. VALENTINE
M. METFESSEL
L. CARMICHAEL
W. R. MILES, *Chairman*

REPORT OF THE COMMITTEE ON THE EXPERIMENTAL STUDY OF
SUGGESTION

July 25, 1936.

The phenomena of suggestion constitute one of the important and promising fields of psychological research. Investigation of these phenomena, when conducted by properly qualified persons, presents no greater dangers than other types of research commonly pursued. Your Committee is of the opinion that there exists little probability of harm to the persons used as subjects in such studies. On the other hand, it seems clear that all possible precautions against undesirable consequences should be taken. So far as your Committee has been able to determine, these precautions are rather obvious in nature and few in number. It believes it inadvisable, however, at this time

to attempt to codify rules of procedure, and is of the opinion that the proper conduct of research on suggestion may best be left to the persons responsible for the investigations undertaken. The Committee recommends that it be discharged and that no further action be taken.

Respectfully submitted,

CLARK L. HULL

OLGA BRIDGMAN

A. T. POFFENBERGER

PAUL C. YOUNG

HERBERT WOODROW, *Chairman*

REPORT OF THE DIVISION OF ANTHROPOLOGY AND PSYCHOLOGY,
NATIONAL RESEARCH COUNCIL

July 25, 1936.

The Division of Anthropology and Psychology has continued during the past year its policy of attempting to further certain lines of research through the agency of technical committees. These committees and the projects upon which they are engaged, with the exception of the newly appointed Committee on the Ethnological Utilization of Moving Pictures, were described in the last annual report of the Division to this Association. The work of two of these committees, those of Child Development and State Archeological Surveys has already been largely, and in time will presumably be entirely, taken over by the societies which have been organized under their sponsorship, namely, the Society for Research in Child Development and the Society for American Archeology. The work of some of the other committees has been seriously hampered by lack of funds. All of the technical committees of the Division have, however, been continued for the coming year.

The one new committee appointed last year, that on Personality in Relation to Culture, has been active in mapping out plans of procedure. With the aid of sub-committees, it has completed the draft of a considerable portion of a Handbook on Psychological Leads for Ethnological Field Workers, and has also taken under consideration a plan for three year fellowships to provide properly trained investigators.

A feature of the annual meeting was the discussion of the functions of the Division and of possible ways of increasing its usefulness.

The Division made twenty-one grants-in-aid, totaling \$9,650.00.

Nine of these were in anthropology and twelve in psychology. The number of fellowships granted was the same as last year, three in psychology and three in anthropology.

New officers of the Division, elected to serve for two years beginning 1936, are: chairman, Dr. Walter S. Hunter; and vice-chairman, Dr. John R. Swanton.

HERBERT WOODROW

REPORT OF THE COMMITTEE ON SOCIAL UTILIZATION OF
UNEMPLOYED PSYCHOLOGISTS

August 12, 1936.

Your Committee appointed to survey the unemployment situation among psychologists, to render whatever aid is possible in the emergency and to make recommendations for increasing opportunities for psychological service offers the following report:

A survey of the unemployed psychologists was made with the coöperation of the members of the A.P.A. and the unemployed themselves. The information was transferred to cards and classified according to sex, geographical location, special fitness, work desired, years since obtaining last degree, and institution granting degree. The Committee's work was planned after a careful examination of this material.

There were 214 cases reported, 129 men and 85 women, distributed geographically as follows:

New York	85 (New York City, 81)
Pennsylvania	18
Illinois	15
California.....	13
Ohio	11
Massachusetts	9
New Jersey	8
Conn., D. C., Wisconsin.....	5
Iowa.....	4
Kansas, N. Carolina.....	3
Mich., Neb., Oklahoma.....	2
Other States	1 or none
No address listed.....	12

Of the 214 cases, there were 12 who had only a Bachelor's degree, 89 who had a Master's degree, 91 who had a Ph.D., and 22 who listed no degree. There were 53 of the total who had received their degree in 1934 or later, and of these 17 reported only a Master's

degree or less. Fifty-four persons gave no dates and these could not be obtained. Assuming that at least some of these had received their degrees during 1934 or 1935, we can say that nearly a third were newcomers into the field and were without experience.

The work desired was reported as follows, some giving more than one choice:

Teaching	73
Clinical	75
Personnel	47
Research	25
Statistical	19
No choice	26

Concerning experience in the work desired, the evidence is uncertain. Experience was reported in 161 cases, absent in 27, and about 26 gave no information. Recommendations were rated "good" in only 132 of the cases, but the value of these ratings is open to question as checking was practically impossible.

From the statistical rather than the human point of view, the problem was a more local one than had been supposed, since over half the cases were in New York, New Jersey, and Pennsylvania, while over one-third were in New York City. Approximately half had only one year or less of graduate training, about one-third had completed their work during the preceding two years, about two-thirds seemed to have had some pertinent experience, and favorable reports were available for somewhat more than half. On the basis of these findings, anything in the nature of a national campaign seemed scarcely justified. Consequently a virtual employment office was set up for dealing with the isolated cases, while a more intensive campaign was directed toward large-scale employment in New York.

Correspondence concerning positions and candidates was heavy during the first half of the year. Organizations such as State and Civil Services, the National Youth Movement, the Civilian Conservation Camps, the Tennessee Power Authority, Catholic and Hebrew organizations were canvassed and the services of our Committee offered. It is impossible to report the degree of success in bringing candidates and positions together for several reasons. Among these was the failure of the candidates to report success or failure, as well as the fact that our Committee was frequently only one of several forces at work in placing candidates. In a number of cases it was discovered that persons recommended on a given job were reported

already employed. An adequate follow-up system was beyond the facilities of the Committee.

The attempt to be of service to a large number of unemployed psychologists in the neighborhood of New York City, where an emergency appeared to exist, reduced itself mainly to getting psychologists appointed to Work Progress Administration projects. In this activity the Committee chairman coöperated with the Association of Consulting Psychologists and the Psychologists' League and became a member of a joint committee of these organizations. The opportunity seemed promising as there were projects approved or under way which called for 55 psychologists. There was a serious obstacle to be overcome in filling these positions in that no psychologist on our list, in spite of his unemployment, was or could be technically "on relief," since none was destitute. W.P.A. jobs were essentially relief jobs, and only 10% of those employed could be non-relief cases. Most of this 10% was used for the administrative officers, leaving little chance for the employment of experts or technicians. Our efforts in the form of committee meetings, appointments and conferences with W.P.A. officials were time consuming and discouraging. The shifting of programs, changing of administrators, and the general uncertainty of the whole W.P.A. finally give little hope of any opportunity for useful psychological employment. While this report is being written, efforts are still being made to get at least temporary assignments on W.P.A. projects.

The experience of your Committee during the year impels it to the following conclusions:

1. That the unemployment of psychologists is only in part a product of the depression. Other factors are the approach-saturation point in the academic field and the trend to non-academic pursuits.
2. That this trend be recognized by the development of adequate training for these non-academic pursuits, and by a more rigid selection of psychological personnel for personality as well as for intellect.
3. That the American Psychological Association accept the responsibility for cultivating new fields for practical psychological service and set up some form of permanent machinery for facilitating contacts between positions and psychologists qualified to fill them.

Your Committee requests that it be discharged as having completed the immediate task assigned to it, and as not an appropriate body for proceeding with the larger and more extended duties which the problem involves.

The expenditures of the Committee amounted to only a very few

dollars, as there seemed nothing to be gained from the expense of physical meetings of the Committee.

Respectfully submitted,

L. J. O'Rourke

P. S. Achilles

M. R. Trabue

A. T. Poffenberger, *Chairman*

REPORT OF THE COMMITTEE ON PSYCHOLOGY AND THE PUBLIC
SERVICE

August 27, 1936.

The Committee of the American Psychological Association on Psychology and the Public Service reports that the Chairman has made a tentative study of specifications for positions for which psychologists are hired in the Government Service. It appears that:

1. Psychologists could make a far greater contribution to the Public Service, Federal, State, and municipal than they are making at the present time.

2. An opportunity for them to do so can be brought about by drawing up more specific specifications for professional positions for which psychologists are or could be especially trained. For example, in July of this year research in psychological testing for the first time was accepted as qualifying experience for Personnel Officers in the Federal Service.

When this preliminary study is completed and after it is revised and approved by the Committee as a whole, it should form the basis for the revision of certain of our university courses to insure more adequate preparation for professional work either as research psychologists or as applied psychologists. As an example of this second type of work, the Committee calls attention to the fact that numerous psychologists are appointed in Federal prisons at fairly attractive salaries. Specifications for such positions should require a certain knowledge of psychiatry, at least sufficient to enable the psychologist to work with a psychiatrist to the mutual advantage of both, and to the advantage of the Federal Service and those examined. Obviously this means adequate training in preparation for such an assignment.

Your Committee proposes to have such specifications approved by the Federal, State, and municipal Civil Service Commissions and to have them sent through the American Psychological Association to the colleges and universities as an aid in curriculum adjustment

and for any use they may be in guidance and placement. Specifications for positions in schools as directors of research or school psychologists can be circulated through similar channels.

Respectfully submitted,

HAROLD E. BURTT

WALTER R. MILES

L. J. O'ROURKE, *Chairman*

REPORT OF THE COMMITTEE TO CONSIDER THE REORGANIZATION
OF THE ASSOCIATION IN RELATION TO REGIONAL
BRANCHES AND REGIONAL MATTERS

July 22, 1936.

To the Council of Directors and Members of the American Psychological Association:

GENTLEMEN: This Committee was created to consider a resolution offered at the Ann Arbor meeting by R. S. Woodworth and A. T. Poffenberger which proposed that "regional or sectional meetings held each year be recognized as official scientific meetings of the Association"; that "their proceedings be published as for the general meeting"; that "each year one of these meetings . . . be designated as the Annual Meeting of the Association"; and that "the psychological section of the American Association for the Advancement of Science be . . . dealt with in every respect like one of the regional meetings."

Your Committee has sampled opinion in several parts of the country and finds:

- a. A general desire to strengthen rather than detract in any way from the Annual Meeting of the Association;
- b. A desire to maintain local initiative in respect to regional societies and meetings;
- c. Considerable emphasis on the value of the psychological section of the A.A.A.S. both as an outlet for research reports and as a means of contact with other scientific groups.

We also find that any adequate regional organization of the A.P.A. at the present time would unduly complicate the administrative machinery of the Association. In lieu of such reorganization, the main objects in view—improved facilities for research reports

and discussions, along with greater rather than less solidarity of the whole body of North American psychologists—can be secured by relatively simple forms of coöperation between the Association and the regional branches and societies. We have in mind the following types of coöperation:

- a. Affiliation of the regional psychological societies with the Association;
- b. Publication in the Association's Year Book of statements of organization, officers and members of the Branches and affiliated regional societies;
- c. Publication in one of the Association's journals of advance notices of regional meetings;
- d. A general understanding that regional meetings are open to any Member or Associate of the A.P.A.;
- e. Publication, so far as financial arrangements can be worked out, of the proceedings of regional meetings in one of the Association's journals; and
- f. More use by our Members and Associates of the facilities of the A.A.A.S., and perhaps closer relations between our Association and Section I.

These aims and policies would be promoted by the following Resolutions which your Committee recommends for adoption:

1. RESOLVED, that the following regional societies be invited to affiliate themselves with the American Psychological Association: The Southern Society for Philosophy and Psychology; The Midwestern Psychological Association, and The Western Psychological Association.
2. RESOLVED, that the Secretary of the Association be empowered to include in the Year Book condensed statements of the organization, officers and membership of the Branches and affiliated regional societies.
3. RESOLVED, that the Branches and affiliated regional societies be invited to submit advance notices of their scientific meetings for publication in the *PSYCHOLOGICAL BULLETIN*, with the understanding that any Member or Associate of the American Psychological Association may attend such meetings and offer contributions to the program, subject, however, to all the rules and program requirements set up by the several Branches and regional societies.
4. RESOLVED, that the possibility of providing in the Association's journals for the publication of full proceedings of regional meetings be examined by a committee of the Association which should include the Editors of the *PSYCHOLOGICAL BULLETIN* and

of the *Psychological Abstracts*, the Secretary of the Association and the secretaries of the Branches and affiliated regional societies.

Respectfully submitted,

JOHN E. ANDERSON

JOHN F. DASHIELL

DONALD G. PATERSON

CALVIN P. STONE

ROBERT S. WOODWORTH, *Chairman*

August 25, 1936.

To the Council of Directors and Members of the American Psychological Association:

GENTLEMEN: At the Ann Arbor meeting of the Association the Secretary was instructed to prepare a By-Law for submission to the 1936 meeting defining the conditions under which societies may become affiliated with the American Psychological Association. In order to carry out this instruction and also to carry out the recommendations of the Committee on the Reorganization of the Association in Relation to Regional Branches and Regional Meetings the following changes in the By-Laws are recommended: (1) that Article XI be repealed; (2) that a new Article XI shall be adopted to read as follows:

"AFFILIATIONS

" 1. Affiliation of national organizations, regional organizations, state organizations, and local organizations with the American Psychological Association is hereby authorized when approved by a two-thirds vote of the Members present at any Annual Meeting provided the petition for affiliation has been presented to the Council and the Association at an Annual Meeting at least one year prior to final action.

" 2. The conditions under which affiliation will be permitted are as follows:

" a. The American Psychological Association shall assume no responsibility whatever for the administration or the financial affairs of any affiliated organization.

" b. Responsibility for scientific programs rests with the affiliated organization except that, when meeting at the same time and place as the American Psychological Association, the affiliated organization's program must be coördinated with the American Psychological Association program through arrangements made with the Program Committee of the American Psychological Association.

"c. Each affiliated organization shall determine its own membership requirements and form of organization except that the principal officers and the governing board of each affiliated organization must be Members or Associates of the American Psychological Association.

"d. Each affiliated organization shall exercise such control over its membership that membership in the affiliated organization shall not imply membership status in the American Psychological Association.

"e. The Secretary of the American Psychological Association shall include in the Year Book the following information for each affiliated organization: (1) name; (2) names of officers; (3) names and membership of principal committees; and (4) lists of the members of such organizations, grouped so as to indicate those who are Members or Associates of the American Psychological Association.

"f. In the event that the Council of Directors believes that the conditions of affiliation are not being fulfilled by a given affiliated organization or that the affiliation is no longer to the best interest of the American Psychological Association, the principal officers of the affiliated organization shall be so informed and the affiliation may be terminated by a two-thirds vote of the Members present at any duly authorized meeting of the Association."

The Secretary believes that the above proposed amendments to the By-Laws will take care of national affiliates such as the Psychometric Society, regional organizations such as the New York Branch, and any other groups desiring affiliation who comply with the conditions set up by the Association. Although the proposal will involve a slight expansion of the Year Book there is no doubt that such an expanded Year Book will become an invaluable reference book to all psychologists. To further increase the value of the Year Book the Secretary proposes that he be authorized to include in the Year Book additional information in regard to those organizations in which the American Psychological Association has direct representation such as the Inter-Society Color Council, the Division of Anthropology and Psychology of the National Research Council, the Social Science Research Council, the National Advisory Council on Radio in Education, and the American Association for the Advancement of Science. The Secretary recommends the following amendments to the By-Laws: (1) the addition of the following clause to the second sentence in Section 2 of Article X: "and such additional material as is authorized in Article XI"; and (2) the addition of the following sentence to Section 2 of Article X: "The Secretary shall print in the

Year Book the following information concerning each organization in which the American Psychological Association has direct representation: (a) principal officers; (b) names and membership on the principal committees dealing with topics of interest to psychologists; and (c) names of the representatives of the American Psychological Association in the organization."

Respectfully submitted,

DONALD G. PATERSON

Hanover, N. H., September 3, 1936.

To the Council of Directors, American Psychological Association:

On instructions of the Council of the Society for the Psychological Study of Social Issues, I am hereby submitting an application for affiliation of this Society with the American Psychological Association, Inc. I am enclosing a copy of the By-Laws of this Society as regularly adopted at the meeting held on Tuesday, September 1, 1936. The officers of this Society are as follows:

Chairman: Goodwin B. Watson.

Secretary Treasurer: I. Krechevsky.

Council: Gordon W. Allport, J. F. Brown, Leonard Doob, H. B. English, Franklin Fearing, George W. Hartmann, Ernest Hilgard, Gardner Murphy, Ross Stagner, E. C. Tolman.

Respectfully submitted,

(Signed) I. KRECHEVSKY, *Secretary-Treasurer.*

New York City, July 15, 1936.

To the Council of Directors, The American Psychological Association:

We, the undersigned, officers of the Association of Consulting Psychologists, acting in behalf of its membership and executive committee, petition you for affiliation of the Association of Consulting Psychologists with the American Psychological Association and the privileges pertaining thereto, under the following conditions:

(a) That all officers of our organization be Members or Associate Members of the American Psychological Association.

(b) That officers of the Association of Consulting Psychologists be listed under "Committees and Representatives" in the Year Book of the American Psychological Association, and that members of the American Psychological Association who are also members

of the Association of Consulting Psychologists be indicated with some appropriate symbol.

(c) That the Association of Consulting Psychologists will not ask the American Psychological Association to be responsible financially or in any other way for the activities of the Association of Consulting Psychologists.

(d) That the American Psychological Association include papers in the consulting field in the program of its Annual Meeting.

(e) That the Council of the American Psychological Association establish a special committee of seven members on consulting and applied psychology, the membership of the committee to be selected as follows: The Council to submit to the Executive Committee of the Association of Consulting Psychologists the names of twelve Members, or Associate Members, of the American Psychological Association who shall be also members of the Association of Consulting Psychologists and at least three of whom shall have been officers or members of the Executive Committee of the Association of Consulting Psychologists and that the Executive Committee of the Association of Consulting Psychologists at its next meeting shall elect by ballot from this list of twelve names the seven members for whom the highest number of votes are cast. That the American Psychological Association refer to this committee matters in the consulting and applied fields.

(Signed) GERTRUDE HILDRETH, *President*

(Signed) ROBERT A. BROTEMARKLE, *Vice-President*

(Signed) ELAINE F. KINDER, *Secretary*

REPORT OF THE COMMITTEE TO STUDY PROBLEMS CONNECTED WITH
THE TEACHING OF PSYCHOLOGY IN HIGH SCHOOLS
AND JUNIOR COLLEGES

August 15, 1936.

Your Committee appointed in 1935 to Study Problems Connected with the Teaching of Psychology in High Schools and Junior Colleges submits a report of progress and a request for an extension of the project.

We have reviewed the meager literature in the field. We have communicated with the superintendents of education in fifteen states and several cities.

We have cooperated with Professors Wm. M. Proctor and Rex Bell, School of Education, Stanford University, and with

Mr. H. Curtis Davis, who under the foregoing professors is doing a Master's thesis on the Status of Psychology in the Junior Colleges of the United States. His detailed report will be published in the Junior College Journal during the next academic year.

We have examined the texts recommended by publishers.

We have been in close touch with the following enterprises closely related to our assignment:

1. Committee preparing Yearbook on "Youth" for the Department of Superintendence of the N.E.A. Chairman: Dr. E. E. Oberholtzer, Houston, Texas.
2. The American Youth Commission. Director: Dr. Homer P. Rainey, 744 Jackson Place, Washington, D. C.
3. Committee of the Progressive Education Association on the Study of Adolescents. Director: Dr. Caroline M. Zachary.
4. Commission of the Progressive Education Association on Human Relations. Director: Dr. Alice V. Keliher.

We believe that the evidence so far obtained supports the following conclusions:

1. The curricula for secondary education in the United States are in flux. The domination of traditional subjects required for college entrance is passing. The great increase in enrollment in secondary schools has forced educators to provide courses more closely related to the interests and life needs of students who will not pursue academic studies or professional careers. Newly organized night school classes, post-graduate high school courses, junior colleges, C.C.C. camps, and youth activities under work-relief or adult education auspices are setting new patterns of education. This is an appropriate time for a re-appraisal of the place of psychology in the curriculum.

2. Current trends in the revision of curricula point to a greater emphasis upon problems which are the concern of psychologists. The direction of change can be described in a word as closer approach to daily living. Many schools now offer orientation courses which include some guidance in techniques of reading, study, memorizing and thinking. Health is a prominent objective, and this is more and more being interpreted to include mental and emotional hygiene. Home-membership is often stressed but since the home has ceased to be the common unit of economic production, its success or failure becomes more and more a matter of personal relationships. Guidance toward wise vocational choice, with all the applied psychology which this properly involves, is a recognized function of the high

school. A major characteristic of the new curricula which are being developed today (especially those in the selected schools participating in the experiment under the chairmanship of Wilford Aikin, on the relations between secondary schools and colleges) has been the expansion of the social sciences. Not infrequently a whole civilization or a broad social problem is chosen as a general theme with which many other "subjects" are correlated or integrated. These studies of society inevitably raise problems of social psychology and anthropology in such areas as race problems, attitudes toward war and peace, delinquency and crime, propaganda, leadership, motivation, individual differences, group thinking, etc.

3. High School: The need of teachers with thorough grounding in psychology as well as other social sciences is indicated. There is considerable doubt about the wisdom of introducing a course called "psychology" into the high school curriculum. For some years new courses were added to the offering until it became difficult to give to any pupil a contact with all of the important fields, or any well integrated educational program. The present trend is toward fewer and more comprehensive units for the curriculum. In keeping with this trend much of the important psychology may be brought into the curriculum in connection with courses on social problems, home life, how to study, or choosing a career. There may well be in addition, good justification for a course in mental hygiene and the understanding of human behavior. Preliminary reports of Dr. Caroline Zachary's intensive study of adolescents in secondary schools and colleges indicate that nothing is more needed than the kind of psychology which will help pupils work out better relations with their parents, with the opposite sex, and with their own ideals and religious impulses.

Notwithstanding doubt as to the advisability of offering "psychology" as a high school course, it is now being done, to a limited extent, in several states. It is offered as a normal training course, particularly in Southern states, in many senior high schools. In the state of Kansas it is also widely offered as a non-normal training course. A 1934 survey reports that it is offered in approximately two-thirds of the Kansas high schools and that between 1929 and 1934 there was a steady increase in the number of schools offering "psychology" as a junior and senior course. Of the 215 instructors in high schools of Kansas, reporting on their training in psychology 48 (22%) had a major in psychology while in college, 52 (24%) a minor, 22 (10%) a major in psychology and education, 12 (6%)

had twelve units in psychology, 67 (31%) had between 4 and 10 units, and 14 (7%) had 3 units or less. As to texts, the Kansas survey reports the following: Of 337 schools reporting, 166 (49%) used Robinson's "Practical Psychology" (state approved), 45 (13%) used Betts' "The Mind and its Education," 4 (1%) used Morgan and Gilliland's "Introduction to Psychology," and 122 (36%) used materials prepared by the instructors.

4. Junior College: Are generally recognized as a part of the secondary schools. (Figures based upon conditions at end of 1935.)

- a. Number: Public, 213; private, 305; total, 518.
- b. Enrollments: Public J.C.'s, 82,701; private, 39,610; total, 122,311.

c. Number J.C.'s giving one or more courses in psychology, 360 (estimated).

d. Number of students taking one or more courses in psychology in J.C.'s, 25,000 (estimated) annually. The number would be greater if all schools offered psychology, but probably would not exceed 32,000.

e. Number of full time and part time instructors in psychology in J.C.'s not known; the report of H. Curtis Davis will give information on this point.

f. Types of courses: three general types of courses in psychology now seem to be attempted: College preparatory; normal training (teacher type); and terminal courses (for those not going to college, utility emphasized). Course names: based on 214 courses reported from 146 J.C.'s (Davis):

General psychology	97%
Educational	45%
Applied	27%
Social	10%
Child.	15%
Abnormal	8%
Experimental	3%
All others	9%

Does not include orientation courses, which teach some psychology.

g. Certification:

(1) No uniformity in public institutions in the several states; some states do not require certificates at all. Where certificates are required, these approximate the requirements for teaching in the high schools of the state.

Example: California has 38 public junior colleges which enroll over 35,000 students annually. Of 797 instructors, 95% hold the General Secondary Certificate which is the one most generally used for high school teaching. (Anyone with this certificate may teach any subject either in the junior college or high school, to which he is assigned by the administrative officers of the school. It matters not whether he has had course work in the subject taught. Fortunately, most of those teaching psychology have had some preparation in this subject, although but few have had a major part in it. Whether adequate or not, no one knows at the present time.)

Example 2: Texas has 20 public Junior Colleges which enroll 5,859 students annually. No certification is required in this state but it is strongly recommended.

(2) Private schools set up their own standards.

h. There appears to be a general demand for applications of psychology in the junior college to problems of immediate and after-college living. This demand is no doubt enhanced by the emphasis placed on vocational courses.

i. Your Committee seriously questions the qualification of those teaching psychology in the majority of Junior Colleges to present psychology as a science to Freshman and Sophomore students; to deal adequately with the applications of psychology in mental hygiene, in education, in industry, etc.; and to organize subject matter for amalgamated terminal courses. Statistical evidence as to the inadequacy of teacher preparation should be forthcoming in the study by Davis.

5. Existing psychology texts are poorly adapted to the needs of the new curricula in secondary schools. The books have been written too much from the logic of the subject and in too little relationship to the life problems of adolescents. Form, vocabulary, pictures and make-up are far from the best publishing standards for school books. Moreover, there has been, with the possible exception of writing now in process, supported by means of a foundation grant and supervised by Dr. Keliher, no attempt to prepare material in such a form as to facilitate integration with the broad units of the newer curricula.

6. It is recommended: (a) that the Committee be continued for one more year; (b) that an appropriation not to exceed \$150 be made available to meet the costs of a canvass of the superintendents of schools in all communities of 5,000 persons or more, to discover (I) awareness of a need for psychology in the secondary school;

(II) preference as to the type of course and materials for introducing secondary school pupils to psychology; (III) probable development of positions in high schools for students with graduate training in psychology; and (IV) additional factual data on the status of psychology in the junior colleges.

Respectfully submitted,

CAVIN P. STONE

GOODWIN WATSON, *Chairman*

REPORT OF THE COMMITTEE ON THE RELATION OF THE AMERICAN
PSYCHOLOGICAL ASSOCIATION TO ITS PUBLICATIONS

June 12, 1936.

At the annual business meeting of the American Psychological Association in New York on September 5, 1934, the following resolution was adopted:

"Whereas the relationships between the Council of Directors, the American Psychological Association, Inc., and the official publications of the Association have never been explicitly set forth in the By-Laws of the Association, therefore be it resolved that a committee of five members be appointed consisting of three Members to be appointed by the President, and the President and the Secretary as *ex-officio* members to study the relationships involved and to formulate suitable amendments to the By-Laws to be presented at the September, 1935, meeting of the Association."

The Committee established by this resolution has selected from the Proceedings of the Association from 1922, onward, all actions that bear in any manner upon the administration of publications. Both contradictory regulations and much variation from year to year in practice are found. The extent of the Association's concern with the problem of publications is indicated by the length of this summary, which occupies sixteen single space typewritten pages. In making up this report the Committee has attempted to follow the traditions of the Association as revealed by its actions. In particular, use has been made of an amendment recommended by the Washburn Committee in 1924, but never incorporated in the By-Laws. It has also considered Mr. Warren's comments in the 1924 Proceedings on the recommendations of the Washburn Committee and the letter of Dr. Morton Prince giving the *Journal of Abnormal and Social Psychology* to the Association. The articles of incorporation and the By-Laws of the Psychological Review Company, together with a

memorandum from the Board of Editors, were available to the Committee.

In any consideration of the Association's publication policy, several points are to be kept in mind. (1) The Psychological Review Company is a corporation under the laws of New Jersey with a Board of Directors and officers. Since the Association owns the stock its control of the company is complete. But until the Review Company is merged with the Association, certain legal requirements imposed by incorporation in New Jersey must be met. (2) The *Journal of Abnormal and Social Psychology* is owned directly by the Association. The deed of gift of the *Journal of Abnormal and Social Psychology* specifically provides that any funds accumulated as the result of the Association's ownership, shall be used for the improvement of that *Journal* and not for any other purpose. (3) *Psychological Abstracts* is owned directly by the Association.

The main action of the Association relating to the administration of the *Journal of Abnormal and Social Psychology* is a vote in 1925, providing that this *Journal* be administered by a committee to consist of the editor of the *Journal*, the Treasurer of the Association and the Business Manager of the Psychological Review Company. No correspondingly specific delegation of responsibility for *Psychological Abstracts* is to be found. In 1930 the Association voted to include the Editor of *Psychological Abstracts* and the Editor of the *Journal of Abnormal and Social Psychology* in the Association Editorial Board.

In 1924 a Business Manager was temporarily set up under a by-law which was adopted subject to the submission of a permanent plan for the administration of the journals by the Council at the 1925 meeting. This was never done.

At the present time the Association owns and administers three sets of journals, each of which is under somewhat different auspices and somewhat different financial control. In some instances officers have been acting without specific designation of authority. No clear description of the mechanism of administration is found in the actions of the Association.

The Committee has attempted to work out a coördinated and integrated plan for the administration of the journals which will give authority and responsibility, provide specific machinery for meeting publication problems and protect the Association's interests.

After preliminary correspondence, a physical meeting of the

Chairman of the Committee, the representative of the Board of Editors, the President of the Association and the Business Editor was held and a series of recommendations formulated. These recommendations, when sent to the Committee, resulted in a number of constructive comments which led the Committee to make a progress report at the 1935 meeting of the Association.

At this meeting an informal discussion of Association publication policy was had with the Council of Directors. Later the members of the Committee present discussed the principles to be followed in revising the series of recommendations. This revision also elicited comment. Further suggestions were also received from the Board of Editors. These, the final recommendations, were adopted at a physical meeting of the Committee at Evanston, Illinois, April 24, 1936.

The Committee recommends first:

That the Council of Directors of the Association, through the administrative officers of the Association, be empowered to dissolve the Psychological Review Company and to merge its affairs with the Association if and when such dissolution and transfer of function is feasible.

The Committee recommends second:

The following amendments to Article X of the By-Laws:

Section 4. The scientific journals of the Association, i.e., the Psychological Review publications, the *Journal of Abnormal and Social Psychology*, the *Psychological Abstracts* and any other journals shall be managed by the Council of Directors, except that the editorial policy shall reside exclusively in a Board of Editors. It shall be the duty of the Council of Directors to manage the business affairs of the Association's publications, and to report on their status and make recommendations concerning their conduct at the annual business meeting of the Association.

The Council of Directors shall have the power to appoint a committee which can be given power and authority to represent the Association in the voting or other management of any stock held by the Association in any publishing corporation or company.

Section 5. The Council of Directors of the Association shall elect a Business Manager who shall act as agent for the Council and the Association in the business management of the publications. The Business Manager shall serve for a term of 5 years at a stipend to be prorated among the journals published by the Association in a

manner to be determined by the Council of Directors. It shall be the duty of the Business Manager to administer the business details of the journals in accordance with the policies outlined by the Council of Directors. He shall submit an annual budget and shall make an annual financial report and such other reports as are required by the Council of Directors or the Association. He shall secure competitive bids for the printing of the journals, shall maintain accurate mailing lists of subscribers and shall be responsible for the storage and subsequent sale of back numbers. He shall serve as Vice-President of the Psychological Review Company. He shall perform such other duties as are incident to his position or may properly be required of him by vote of the Council of Directors or the members of the Association.

Section 6. The Board of Editors shall consist of one editor for each journal published by the Association, and the Business Manager *ex-officio* but without vote. The terms of editors shall be six years, one editor retiring each year. The expiration dates of the terms of the present editors shall be: *Journal of Experimental Psychology*, 1940; *Psychological Review*, 1941; *PSYCHOLOGICAL BULLETIN*, 1942; *Psychological Monographs*, 1943; *Journal of Abnormal and Social Psychology*, 1944; and *Psychological Abstracts*, 1945. Editors shall be selected by an Electoral Board which shall consist of the President, the Secretary, the four senior elected members of the Council of Directors, and the members of the Board of Editors. Election shall be by a preferential ballot of the members of the Electoral Board taken by the Secretary of the Association upon a list of nominees submitted by the members of that Board. In the case of the death, disability, or resignation of any editor, the same procedure shall be followed, election to be for the remainder of the unexpired term. The Board of Editors shall select a chairman who shall preside at the meetings of the Board of Editors and shall conduct the official correspondence of the Board. It shall be the duty of the Board to outline general editorial policy, and to supervise the editorial conduct of the journals and to perform such other duties as are incident to its position or may properly be required by vote of the Council of Directors or the Members of the Association. On any question involving reorganization of the journals or fundamental changes of policy, the Board shall secure the approval of the Council of Directors and of the Association. The Board shall have the power to draw up rules and regulations for the conduct of its own meetings, for the guidance of editors, for the selection of assistant and associate editors, and for the submission of manuscripts. It shall be the duty

of each editor to conduct his journal in conformity with the general policies outlined by the Board of Editors. The decision of an individual editor as to the selection or rejection of manuscripts submitted to him shall be final.

Section 7. The Board of Editors, including the Business Manager shall meet jointly with the Council of Directors once each year just prior to the annual meeting of the Association, to discuss publication policies. The President of the Association shall preside at this meeting and the Secretary of the Association shall act as Secretary. At this meeting reports from the Business Manager and the Board of Editors shall be presented.

The Committee recommends third:

At the present time the Association has several disbursing officers, *i.e.*, the Treasurer, the Business Editor, and the editor of the *Psychological Abstracts*. The Committee feels that this is an unwise procedure and that all funds should be centralized in the Treasurer's office and subject to audit. The present disbursing officers could then forward bills and accounts with the proper authorization to the Treasurer for payment as is the practice in most business houses. Such a procedure would involve additional work for the Treasurer which could be met by increasing the Treasurer's stipend and charging the increase on a *pro rata* basis to the various publications ventures of the Association. It may be noted that under our By-Laws none of the officers now disbursing funds with the exception of the Treasurer has clear authority to do so.

The Committee therefore recommends that Section 7 of Article IV be amended by inserting the words, "including those of the Association's publications" between the word "securities" and the phrase "and to deposit the same" in the first sentence of that section and to insert the sentence "He shall also serve as Treasurer of the Psychological Review Company" in Section 7 of Article IV, between the phrase "the bond to be filed with the Secretary of the Association" and the beginning of the next sentence, "He shall, at all reasonable times, exhibit his books, etc."

The Committee recommends fourth:

At the present time audit of the Association funds is made by a committee. Since the funds of the Association are considerable in amount, it would seem wise to protect both the officers and the Association by a standardized system of accounts and a regular and professional audit. The Committee therefore recommends that the

present Section 8 of Article IV of the By-Laws be renumbered to become Section 9, Article IV, and that a new Section 8 be inserted as follows:

Article IV, Section 8. The accounts of the Association, including those of its publications, shall be audited annually at the close of the fiscal year by a certified public accountant, who shall submit a report to the annual business meeting of the Association through the Council of Directors.

The Committee recommends fifth:

At the present time no power nor any method of recalling officers is provided in the By-Laws of the Association. The Committee considered a provision for recall. But it felt that editors should not be treated differently than other officers of the Association and is therefore recommending a general recall provision. Although the Committee hopes and anticipates that it will not be necessary to use this provision, it feels that some provision for recall is necessary in order to safeguard the interests of the Association, particularly when officers are elected for long terms. The Committee therefore recommends the following new Section to be added to Article IV of the By-Laws.

Article IV, Section 9. If any officer of the Association, except the President and the members of the Council of Directors, is unable to perform the duties appropriate to his office because of incapacity, disability or neglect, he may be recalled from office at any time by a two-thirds vote of the board which made the original selection, *i.e.*, in the case of the Secretary and the Treasurer by the Council of Directors; in the case of an editor, by the Electoral Board. Whenever an officer is recalled, the board making the recall shall report the fact of recall and the reason for it at the first subsequent annual meeting. In case any position is filled by an employee rather than an elected officer, such employee may be removed for cause by a majority vote of the board which made the original selection.

H. A. CARR

S. W. FERNBERGER

CLARK L. HULL

D. G. PATERSON

JOHN E. ANDERSON, *Chairman*

REPORT OF THE COMMITTEE TO STUDY THE COSTS OF CONDUCTING
THE AFFAIRS OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION
AS NOW OPERATED AND TO MAKE ESTIMATES OF PROBABLE
COSTS OF OTHER MODES OF ORGANIZATION

September 2, 1936.

The Committee appointed by the Council of Directors to Study the Costs of Conducting the Affairs of the American Psychological Association as Now Operated and to Make Estimates of Probable Costs of Other Modes of Organization wishes to express its appreciation both of the importance and the timeliness of the problem assigned it. The interval since the appointment of the Committee has, however, been too short to enable it to collect the evidence essential for a well-considered proposal.

The Committee respectfully requests, therefore, that it be continued with such changes in personnel as the Council of Directors may see fit to make, and with instructions to submit to the Council one or more detailed plans of administrative organization.

The Committee suggests further that the Council be given power to take definitive action upon such plans with the express understanding that the American Psychological Association shall not be committed to expenditures for administration in excess of the total at present allocated to its various administrative operations.

Respectfully submitted,

A. T. POFFENBERGER, *Chairman*

AMERICAN PSYCHOLOGICAL ASSOCIATION, INCORPORATED

Budget, Fiscal Year, December 16, 1936, to December 15, 1937

Estimated Expenditures

Printing and supplies	\$700.00
Postage and express	900.00
Telephone and telegraph	25.00
Reprints and Proceedings	600.00
Year Books	850.00
Treasurer's bond and safe deposit box	75.00
Secretary's stipend	1,500.00
Treasurer's stipend	300.00
Incidentals, annual meeting	700.00
Exchange and collection fee on checks	25.00
Subscriptions to <i>Psychological Abstracts</i> and BULLETIN	8,750.00
Committee on Animal Experimentation	25.00
Apparatus exhibit	50.00
Inter-Society Color Council	25.00
Committee to Study Problems Connected with the Teaching of Psychology in High Schools and Junior Colleges	150.00
Auditing accounts of Association	200.00
Total Budget of Expenditures.....	<u>\$14,875.00</u>

Estimated Income

Interest on bonds and savings accounts	\$580.00
Dues	15,500.00
Sale of Programs, Year Books, etc.	100.00
Total Estimated Income.....	<u>\$16,180.00</u>

ABSTRACTS OF PAPERS

PROGRAM: GENERAL

WEDNESDAY, SEPTEMBER 2, 9:30 A.M.

15 SILSBY

CLARK L. HULL, *Chairman*

Intonation in Violin Performance. PAUL C. GREENE, State University of Iowa.

Performances by six professional violinists were studied. The purpose was to determine (1) whether these performers typically played in either the natural or the equally tempered musical scale, and if not (2) whether they tended to enlarge or contract musical intervals in relation to the theoretical values in these scales. The major aspect of the study was limited to an analysis of five intervals—major and minor seconds, major and minor thirds, and perfect fourths.

Performances of three standard musical selections were recorded by an oscillographic technique. Measurements of the average fundamental frequency of the main body of the tones were made, and interval extents were computed and analyzed. Tests of the reliability of measurement showed that the largest expected error ($\pm 3SDs$) for any given frequency was approximately .03 tone, but that at least 78 per cent of the frequency measurements were statistically significant to .01 tone.

The major findings of the study are as follows: (1) The six violinists typically performed in neither the natural nor the equally tempered scale. (2) As compared with natural and equally tempered intonation, major seconds and major thirds tended to be enlarged, minor seconds and minor thirds on the average were contracted, and perfect fourths tended to approximate the theoretical

scale values for that interval. (3) Performances of these intervals on the average approximated their theoretical values in the Pythagorean scale. [10 min., slides.]

The Reliability of Introspection. WILLIAM A. HUNT, Connecticut College for Women.

At present, the phenomenological approach to emotion is neglected, largely on considerations of methodology. This paper reports upon the introspective reports gathered in a group situation involving a sudden auditory stimulus of a "startling" nature. Two different groups, of 74 and 91 subjects, were tested in successive years. The agreement in the results shows the possibility of gathering apparently valid and reliable phenomenological descriptions in group situations of the experience of startle. The promise of this methodological approach in the field of emotion is indicated. [10 min.]

Perceiving and Symbolizing: An Experimental Study. W. S. NEFF, Cornell University.

The problem of the derivation of developed psychological activities from more fundamental operations such as perceiving has received little treatment in the experimental literature. The structural, behavioral and configurational approaches to the study of the 'higher mental processes' tend to neglect possible relationships to perceiving and carry on their study at a higher level. A sounder approach is to involve the organism in a perceptive situation and study the ways in which he moves away from perceiving in the direction of more developed modes of performance.

Our technique involves variation of stimulus-patterns in certain well-defined ways. We utilized two series of drawings representing familiar objects in various stages of conventionalization, including a number of 'symbolic' drawings—scenes bearing various relations to objects, but not depicting the objects themselves. The figures were presented in varying orders and for various temporal intervals. Five observers yielded a total of 1,750 reports.

Our results indicate the existence of five related modes of performance involved in the immediate apprehension of figures. These we have designated as the *figurational* (object apprehended as just a line drawing), the *depictive* (object apprehended as concrete and

particular), the *abstractive* (object apprehended as conventionalized), the *generalized* (object apprehended as generalized member of a class), and the *symbolical* (object apprehended as a surrogate for something else). These modes are found to appear under different conditions and to involve different issues.

These five varieties of performance indicate a gradation toward comprehension and thinking. In addition, the distinguishing of these five modes suggests that the activity of perceiving is more varied than has been assumed. [15 min., slides.]

Language and Concepts. EDNA HEIDBREDER, Wellesley College.

A series of experiments on the formation of concepts brought out several lines of evidence on the rôle of language in the acquisition and use of concepts.

The procedure was a modification of that used by Hull; in what was apparently a memory experiment, each subject learned to associate given nonsense syllables with given situations under conditions which permitted him to discover that the many different situations to which a given syllable was applied possessed a common characteristic. The process of concept formation was measured in terms of repetitions, prompts, and opportunities to apply the concepts to new situations. At the close of the experiment each subject was required to write verbal definitions or descriptions of the concepts he had formed, and also take an objective examination of the single choice type. The subjects, 220 college students, were studied individually, but were classified into groups on the basis of variations in the experimental procedure and in the materials presented.

The results indicate (a) that the readiness with which a concept is formed is determined not by the ease or difficulty with which its name (nonsense syllable) is memorized, but by the relation between its referent and the perceptual situations in which it is presented; (b) that a concept may be used with consistent correctness though the subject cannot formulate it; (c) that the ability to formulate a concept is more closely related to the nature of its referent than to the readiness with which it is acquired or to the accuracy with which it is applied; and (d) that there are several very different ways in which language is used as a tool during concept formation and that these methods vary with the situation.

The bearing of these facts on the process of concept formation will be considered. [15 min., slides.]

Imitativeness, Suggestibility, and Coöperation in Chimpanzee.

ROBERT M. YERKES, Yale Laboratories of Primate Biology.

The speaker plans to present a general account of these forms and aspects of behavior in their relations to the uses and usefulness of chimpanzee as material of research. The report will be based on extensive experience in the Yale Laboratories of Primate Biology and the results of several experimental studies of social behavior. [15 min.]

The Evaluation of College Faculties. M. E. HAGGERTY, University of Minnesota.

This study grew out of the situation presented by the accrediting needs of the North Central Association of Colleges and Secondary Schools. Standards describing faculty training had proved unsatisfactory in practice. The study attempted to determine the validity of existing standards and to derive new and better accrediting techniques.

By means of an inquiry blank information was collected from 4,000 college teachers resident in 57 junior colleges, teachers colleges, and universities. Criteria were developed by using data from the following sources: personal ratings of institutions by four different inspectors; subject-matter tests in social studies, natural science, and modern languages; tests of reading comprehension; an evaluation of mathematics instruction made by a jury of mathematicians; records of graduates in graduate study; and examination records of applicants for medical school entrance. From among many criteria constructed from these data one was selected for correlation purposes. The validity of a number of measures of faculty competence was determined. The indexes employed in calculations were measures of faculties considered as units and not of instructors as individuals. The measures that were retained as being useful for accrediting purposes were the following: per cent of faculty holding the doctorate degree; per cent of faculty not having the doctorate who have the master's degree; average months of graduate study; average years of experience in higher institutions; books and monographs published; scholarly articles published; membership in learned societies; attendance at meetings of learned societies; and appearances on the programs of learned societies. Regression equations were employed for purposes of analysis and weighting. It appeared that the two most important items for the evaluation of college faculties were publication of scholarly articles, and attendance

at meetings of learned societies. Both of these appeared more significant than any measure of degrees, graduate study, or experience. [15 min.]

An Application of Psychophysical Techniques to Marketing Research. JOHN G. JENKINS, Cornell University.

Faced with the possible necessity of installing expensive precision dispensing apparatus, a beverage company sought our aid in determining fineness of taste-discrimination for their product. Preliminary trials in a special laboratory at Cornell suggested the feasibility of a modified constant-stimulus difference method. In one series the attempt was made to substitute a large number of observers making a small number of trials for the conventional small group making many trials. In a second series a group of moderate size completed ten trials each. As a check, five trained observers followed through the conventional formula of fifty trials for each value. Figures obtained by these three methods showed close correspondence, and those from the modified methods shed useful light on individual differences. Employment of these interlocking techniques yielded data of high reliability. [10 min., slides.]

PROGRAM: ANIMAL PSYCHOLOGY I

WEDNESDAY, SEPTEMBER 2, 9:30 A.M.

105 DARTMOUTH

HARVEY A. CARR, *Chairman*

A Study of Behavior Patterns of the Ring-Dove to Multiple-Choice Problems. GEORGE T. AVERY, Colorado State College.

An investigation was made of the response patterns of the ring-dove to multiple-choice problems by the use of the multiple-choice apparatus devised by Robert M. Yerkes.

1. The problem "first to the right" was solved in from 56 to 163 trials.
2. The problem "second to the left" was never completely solved but one dove went through the series with but one error.
3. The solution of Problem I increased the difficulty of Problem II.

4. Food and punishment were insufficient as a drive. The pecking and fluttering of a companion bird were more successful. [10 min.]

Distance-Preferentials—A New Apparatus and Some Results.

EDWARD C. TOLMAN, University of California.

It has been previously demonstrated that rats will select the "shorter" of two distances to food—whether these distances be defined spatially (DeCamp), temporally (Sams and Tolman), or in terms of force-resistances (McCulloch). But such previous results could, theoretically, all be explained by differences in temporal intervals. For in all three cases, that for spaces and that for force-resistances, as well as that for times, the stimuli at the beginning of the preferred side were temporally nearer to the final goal-stimuli than on the non-preferred side. The greater "conditioning" to this "shorter" side might depend, therefore, solely on this smaller temporal interval.

To see if a "short" distance would still be chosen when this difference in the temporal intervals was eliminated a new apparatus was constructed (acknowledgments to Dr. Jack Buel and Mr. Horace Richheimer) in which the animal has to choose between two treadmill compartments both of which lead to food. Under such conditions the animals come to choose the side with the slower treadmill (acknowledgments to Mr. Richheimer) even though they have to spend an equal amount of time on it.

Other experiments were then performed with both the string-pulling set-up (acknowledgments to Miss Helen Campbell) and with this treadmill apparatus. With food on one side only it was found that rats learn to select this food-giving side faster, when both strings are long than when both strings are short, when both weights are heavy than when both weights are light, and when both treadmills are fast-moving than when both treadmills are slow-moving.

An anthropomorphic, a conditioned reflex, and a vector type of explanation suggest themselves. The writer favors the last. [15 min.]

The Effect of Floor Cues upon the Mastery of the Unit-Alike Maze.

QUIN F. CURTIS, University of Michigan.

Shepard has shown that rats are able to discriminate sensory differences in the floor of the maze which can be used as the primary cue in maze learning. This investigation studies the influence of

various degrees of floor control upon maze learning, when other cues were reduced or made unreliable.

The maze was composed of a series of 5 geometrically identical units, one of which required a reaction opposite to that given in the others. This maze could be mastered only by differentiating the unit which required the "exceptional" reaction from the others in the series. The use of exteroceptive cues was tested frequently by alteration of various features of the maze and its environment. The use of kinaesthetic cues was prevented by starting the rats in random order at one of three different entrance points on each trip through the maze.

Six types of floor construction were at different times used in this maze situation: a sand floor covered with rubber sheeting; floors of bare sand having depths of $1\frac{1}{2}$, $3\frac{1}{2}$, and 9 inches, a concrete floor, and a floor of suspended wire mesh. Thirty rats were tested in one or more of these maze situations.

Results show that in each of the six maze situations, floor differences are more important than other sensory factors in determining the maze responses. Other sensory factors being held constant, the mazes vary greatly in difficulty for the rat according to the floor upon which they are constructed. The easiest floor, the concrete, was mastered with 87% success after 100 trials, while the wire screen floor was learned to 47% success only after 500 trials. These differences cannot be attributed to mechanical difficulties in locomotion. Theoretical implications are discussed. [15 min., slides.]

The Ability of the White Rat to Learn an Absolute Brightness Discrimination. DAEL L. WOLFLE, University of Chicago.

Purpose: To determine the ability of the white rat to learn an absolute brightness discrimination.

Method: Seven rats were trained (10 trials daily) to discriminate a light of brightness 16 from lights of brightness 1 and 256 (numbers indicate relative brightnesses). The correct light was the brighter on half and the dimmer on half the trials. Following learning, three tests were given.

Results: 1. *Rats can learn an absolute brightness discrimination.* All animals attained a criterion of 95 correct responses out of 100 choices in 290 to 460 trials (including criterion) and with 62 to 101 errors.

2. *An absolute discrimination is learned more slowly than a relative one.* Only one animal met a criterion of 20 consecutive correct

choices with fewer errors than were made by the poorest animal learning a relative discrimination under otherwise comparable conditions.

3. *Trained rats continue to make absolute choices when rewarded for any choice.* On 30 trials with all three lights present, light 16, now of medium brightness, was chosen 30, 30, 29, 28, 25, 19, and 14 times. Chance score=10. On 30 different combinations each including two to five lights of different brightnesses, light 16 was chosen 24, 24, 24, 20, 19, 16, and 16 times. Chance score=9.

4. *Trained rats can recognize the positive or negative character of a single light.* The rats were rewarded for approaching light 16 and punished for approaching lights 1 and 256 when they were presented singly. Two animals attained an accuracy of 95 correct responses out of 100 choices. Discrimination in the remaining animals was shown by a better than chance score or by going rapidly to light 16 and slowly to lights 1 and 256. [15 min., slides.]

The Response of Chimpanzees to Size Relationships. KENNETH W. SPENCE, Yale Laboratories of Primate Biology.

Previous investigations of size and brightness discrimination have led generally to the conclusion that animals learn to respond to the relative properties of the stimulus situation and not to the specific or absolute properties of one or other of the stimuli. Almost without exception, however, these studies have failed to demonstrate the universality of such a "relational" response.

The present experiment is concerned with the study of the response of chimpanzees to size differences with the object of discovering the conditions under which "relational" responses do and do not occur. Ten adult chimpanzees were trained to choose the larger (or smaller) of two white squares. Subsequent critical tests involving stimuli larger and smaller than the training stimuli indicated that the animals trained originally to the larger stimulus always responded relationally, but that those trained to the smaller stimulus failed to do so, at least in some of the tests. Following these critical tests the original training of six of the animals was reversed until the converse response was learned. That is, animals trained originally to the larger stimulus were now trained to respond to the smaller stimulus and vice versa. In critical tests subsequent to this training the animals generally failed to respond in accordance with their more recently acquired "relational" response. In the discussion of the results the adequacy of the view that the animal is

responding to the relative properties of the stimulus is questioned, and an examination is made of a theory based on the generalization or irradiation of conditioned excitatory and inhibitory tendencies that is proposed to account for the experimental results. [15 min., slides.]

Some Factors Affecting Solution of Box-stacking Problems in Chimpanzee. S. D. S. SPRAGG, Yale Laboratories of Primate Biology.

The experimental work to be reported is part of a project (in collaboration with Doctor Robert M. Yerkes) the purpose of which is the development and standardization of a group of tests for measuring the adaptive capacities of chimpanzees. By means of the standardized testing situation used and the four problems presented, continuing comparability of results is made possible.

Chimpanzees from 3 to 9 years of age have been tested on the following problems: I, single box; II, two boxes; III, rectangular box; IV, three boxes. Some of the animals have been retested after periods of a year or more. The results are discussed with reference to the conditions on which problem solution seems to depend, and in terms of the correlation of success with age, and with experimental sophistication. [10 min., slides.]

Response of Young Chimpanzees to Animate and Inanimate Psychological Barriers. GEORGE M. HASLERUD, University of Tennessee.

The Yale Laboratories of Primate Biology provided animals and facilities for these preliminary experiments.

The purposes are: (1) to study the technique and value of psychological barriers; (2) by this method to test Yerkes' hypothesis that movement rather than appearance of object is the primary avoidance-response determiner in chimpanzee.

Eight chimpanzees, one to four years old, were trained to reach through wire fence for fruit placed at arm's length. Records were made of modification of response when a single mounted or live small alligator, snake, etc., was introduced just beyond reach and 3 or 90 cm. from the food.

Results indicate that the psychological barrier method is limited, especially in younger animals, by rapid negative adaptation to any object near the food. Differentiated reaction to the various stimuli, animate and inanimate, increases with age. [10 min., slides.]

An Experiment on Insight and Trial-and-Error in Monkeys.
A. H. MASLOW, Teachers College, Columbia University.

In collaboration with Walter Grether in the Wisconsin Primate Laboratory, seventeen monkeys, experienced in simple delayed reactions, were tested as follows: Placement of food under correct cup was not seen by the animal (as in delayed reactions)—instead he was shown the *empty* or *incorrect* cup, and allowed a choice after ten seconds. These types of solutions appeared: Immediate solution (9 animals); Random choice followed by sudden solution (5 animals); Irregular improvement (2 animals); Position habit and failure (1 animal). The ability was transferred to 3 and 4 cups with very slight decrement.

In retention tests given eight animals 4-7 months later, all retained perfectly except 2 of the 3 that had shown no immediate solution originally.

This simple technique, used with many species of monkeys, offers a means of quantitative attack on the problem of comparison of insight with trial-and-error. [10 min.]

PROGRAM: POLITICAL PSYCHOLOGY

WEDNESDAY, SEPTEMBER 2, 10:00 A.M.

104 McNUTT

EDWARD L. THORNDIKE, *Chairman*

Attitudes of College Students Toward War, Race, and Religion, and the Changes in Such Attitudes During Four Years in College.
VERNON JONES, Clark University.

The attitudes of college students toward war, race (Negro), religion, and the church were studied over a period of six years by means of five of the Thurstone Attitude Scales. Two classes were followed from entrance to graduation. Other classes were followed for shorter periods. Both status and change scores were obtained, and the relation of various factors, such as mental ability, major subject, political and religious leanings, to such scores was investigated. Also a study was made of the degree to which radicalism or conservatism are general factors running throughout the tests.

Some of the main results are as follows: (1) The change in student attitude from freshmen to senior year was, on the average,

rather small on all tests. (2) The changes which were found were, on the average, in the direction of liberalism. (3) The major subject of students did not have a pronounced effect upon the amount of change on the tests here employed, but in general students majoring in natural science changed most, and those in history changed least. Students specializing in economics, sociology, English, and languages occupied the middle ranges. (4) The influence of religious affiliations and political leanings upon attitudes was found to be rather specific. (5) Intercorrelations among attitudes of students revealed the fact that liberalism and conservatism are far from unitary characteristics. There seem to be constellations of attitudes, and within a given constellation the individual is rather consistently a conservative, a liberal, or a radical, but his position on the conservative-radical scale in one constellation is a poor index of what his position will be in another. [15 min.]

Political Knowledge and Party Preferences of Students. THELMA HUNT, George Washington University.

This paper reports a study of knowledge of current politics and political party alliances or preferences of several hundred college students in Washington. The findings of the present study are compared with those of a similar study made eight years ago. Knowledge of politics (as measured by an objective test) is related to sex, age, major subject or course in college, home State, interest in politics, occupation if employed, and intelligence. The political party to which the student "belongs" is affected in different degrees by the party of his father, the State in which he has lived, education, sex, interest in politics, and knowledge of politics. Present students show no evidence of greater knowledge of or interest in politics. They show fewer stated party preferences, less agreement with their fathers, and considerable change in proportions stating preferences for the various political parties. [10 min.]

The Psychology of International-Mindedness Studied by the Method of Opinion Correlates. THEODORE F. LENTZ, Washington University.

By an analysis of several hundred opinions of several hundred college students, a study was made to locate the opinions not logically and obviously, but statistically, related to the trait of International-Mindedness. This was done by correlating by the U.L. method each

item of the composite with the International-Mindedness scores. Marked success in locating such opinions points to the reality of a generalized and more or less composite trait which expresses itself in matters distinctly homely and domestic as well as in those involving foreign relations. Intercorrelations among the different types of opinions indicate significant inter-relations among international and non-international attitudes.

Thus far, the most marked aspect of this basic tendency is that of generalized radicalism. In fact, to measure radicalism and internationalism independently seems to present a major problem. [10 min.]

Political and Economic Stereotypes: Frequency and Patterning.
ROSS STAGNER, University of Akron.

The method used in this investigation was to submit to adults in various occupations a sheet on which were forty words and phrases relating to various social concepts. They were asked to cross out any words which were unpleasant to them. About 500 adults in all marked the sheets. The majority were factory and office workers and small business men.

The stereotypes most crossed out were: Ku Klux Klan, 90%; Communist, 80%; Child Labor, 74%; Nazi, 73%. Constitution and Supreme Court were crossed out by less than 5% of the cases. Townsend Plan was disliked by 48% and American Liberty League by 30%. Socialist, theoretically as unpleasant as Communist, is crossed out by only 43% as against the Communist 80%.

The most obvious pattern found is a tendency to strike out all terms having a radical connotation. Ninety-eight per cent of cases striking out Socialist also strike out Communist. Conversely, of the cases not striking out Communist, only 5% struck out Socialist. Radical, Revolution, I.W.W., Pacifism and Labor Union are other words fitting into this pattern.

There is also evidence for a pattern which groups together the terms Republican, Democrat, Big Interests, Trusts and American Liberty League. Considerable inconsistency is found throughout, however. Wide individual differences in the number of words crossed out interfere with a clear demonstration of consistency.

An opinion sheet which was checked at the same sitting by many of the subjects reveals that these patterns (of stereotypes) are gen-

erally harmonious with the opinions which the subject is willing to endorse.

Comparison of parents and children, husbands and wives, sex differences and differences between political groups will be presented. [15 min.]

A Field Experiment on the Comparative Effectiveness of "Rational" and "Emotional" Political Leaflets in Determining Election Results. GEORGE W. HARTMANN, Teachers College, Columbia University.

During the election campaign of 1935, the experimenter divided the city of Allentown, Pa., into three classes of wards: (1) an "emotional" area in which all the resident adults received leaflets written in a distinctive advertising manner urging support of the Socialist ticket; (2) a "rational" region, in which a more academic kind of persuasion was used; and (3) a "control" district where nothing was distributed. The contrasted appeals were identical in general appearance, typography, format and number circulated; the written content of the two motivating "stimuli" varied primarily in the relative amounts of reflection and sentiment included and in the corresponding style of language employed. When the outcome was analyzed by comparing the 1935 vote with that of 1934 for the respective "heads of the tickets," the Socialist increase was 50% in the "emotional" wards, 35.42% in the "rational" wards, and 24.05% in the "control" wards; comparable figures for the Republicans were 20.44%, 24.03% and 15.86%; for the Democrats, 8.08%, 15.07% and 14.33%. All parties gained absolutely because there was a 16.69% increase in electoral participation over the preceding year, but the Socialist vote rose "disproportionately" in the two areas where special stimulation was applied. A post-election series of oral interviews showed a much greater memory value for the "emotional" appeal, confirming the tendency revealed at the ballot-box. The evidence indicates that political stimulation which integrates itself with strong permanent central attitudes and prepotent wants is relatively more efficient as a vote-getting device than that which relies upon logical exposition. [15 min.]

PROGRAM: VOCATIONAL PSYCHOLOGY

WEDNESDAY, SEPTEMBER 2, 10:00 A.M.

13 CARPENTER

A. T. POFFENBERGER, *Chairman*

Job Satisfaction of Psychologists. ROBERT HOPPOCK, National Occupational Conference.

Job satisfaction blanks mailed to 203 members and associates of A.P.A., listed in the 1935 Year Book as interested in vocational or industrial psychology, were returned anonymously by 66 persons. Their responses indicate an average level of job satisfaction at the 64th percentile of the employed adult population, which is almost exactly the level of the professional, managerial, and executive class. A majority report satisfaction with most of the aspects of their jobs. Among the minority, 15% find too much politics in their jobs, and have to do things that hurt their consciences. Eight per cent "often feel just miserable." Average salaries have decreased \$157 in four years to a present average of \$3,261. [10 min.]

A Balanced Testing Program for Use in Placement and Vocational Guidance. EDWARD E. EDELMAN and WALTER A. LURIE, Jewish Vocational Service, Chicago.

There are two main types of problems which the vocational psychologist attempts to answer by test: (1) How proficient is this individual now at some particular task? (2) What tasks should this individual be expected to perform best? Any well-considered attempt to answer the two problems demands recognition and differentiation of those psychological instruments which are suitable for the investigation of each problem, since there is in general little overlap. Task samples show several important advantages in testing proficiency. Systematic analysis of the individual and the job is necessary for any useful program of aptitude testing. Without such analysis use of the psychographic method is of doubtful value. The outline of a testing service based on these theoretical considerations is presented, with preliminary results from its application. [10 min.]

Occupational Differences in Manipulative Abilities. LORENE TEE-GARDEN, Cincinnati Employment Center.

A battery of manipulative tests makes possible rating of job applicants on specific traits of manipulative performance: speed, accuracy, delicacy of control, single or two-hand manipulation, ability to follow demonstration or instruction, to react to details, organize, maintain or increase speed, solve problems, etc.

Test performances of adults in fourteen men's and sixteen women's occupations show no two occupations presenting identical combinations of test levels on the tests used. Comparisons of median and quartile points of each occupational group with median and quartile points of the general norms for each test indicate those manipulative traits in which each occupation rates high or low, despite the fact that many persons with varied experiences are included in several occupations. Analysis of an individual's test ratings indicates types of occupation for which the applicant seems best fitted. [10 min.]

Increasing the Significance of Single Measures. W. V. BINGHAM, Stevens Institute of Technology and Personnel Research Federation.

A psychologist whose immediate concern is to help an individual to ascertain his educational and occupational aptitudes faces statistical problems in the evaluation of test scores which might not trouble him if he were occupied solely with mass data, group differences, or factorial research. This paper defines three of these problems and describes ways in which the precision and meaning of individual measures can be enhanced.

1. When transmuting order-of-merit ranks into linear scores before pooling them, improvements over the usual method are suggested whereby the reliability of criteria, as well as of pooled ratings of an individual, may be increased.
2. While very high or low scores are of special interest to counselor and client, the reliability of these extreme deviations is ordinarily less than of scores near the mean. Neither Garrett's standard error of measurement, Kelley's standard error of a true score estimated from a single obtained score, nor O'Connor's standard error of an individual score furnishes information as to the width of the "zone of approximation" within which an individual's estimated true score probably lies, if his obtained score is very low or high.

3. The importance of salvaging certain statistically "not-significant" differences, both when comparing groups and when appraising an individual's aptitudes from the data on his cumulative record, is illustrated. [15 min.]

Analysis of 4,738 Test Items. RICHARD STEPHEN UHRBROCK, Cincinnati, Ohio.

Thirty-six tests, containing 4,738 items, were administered on the work-limit basis to ninety-six college-trained men employed in a large manufacturing organization. The purpose of this research was to devise a test for future selection of college graduates with mental characteristics like those of the best of the present group of college-trained employees.

The major statistical problems encountered consisted of obtaining a reliable criterion and selecting and carrying out a method of item analysis.

Each of 35 executives rated the men, using order-of-merit rankings, graphic rating scales, and check-lists. All ratings were transmuted to have means of 50 and standard deviations of 20. The reliability of the composite criterion was .88.

Each position in the Hollerith field represented an item. A hole was punched for each error; correct answers were not punched. Upper and lower criterion groups (27% in each) were compared. The number of errors in the high (or low) criterion group was obtained on the Hollerith counting sorter for ten items at a time. The figures thus obtained were converted into difficulty and validity measures.

The following results were obtained: 541 items were answered correctly by all of the men. The relationship between difficulty and validity is curvilinear; items with approximately 45 to 85% correct responses being the most valid. There were 2,737 items with positive validities, 1,061 with exactly zero validities, and 940 with negative validities. The 708 items with validities of +.20 or more will be retained for use in future tests.

Dr. Albert K. Kurtz was responsible for the statistical analysis of these data. [15 min., slides.]

Statistical Prediction of Law School Success. RICHARD W. HUSBAND, University of Wisconsin.

In order to assist the University of Wisconsin Law School to select those most fit for acceptance from all their applicants, we have

made a thorough statistical study of all measurable factors which might have a bearing on grades in law school.

The first part of the study consisted in using the multiple correlation technique, attempting to predict the dependent variable, law grades, by means of undergraduate grades, intelligence scores, and the Yale Legal Aptitude test. We tried various combinations of two of these variables, as well as all three. The grades of the students have been traced over four semesters of law school, to validate our predictions. The three-variable multiple is +.64, which predicts actual earnings within five points in three-fourths of the cases.

In the second part of the study we correlated undergraduate grades in various subjects with law school success, to see if excellence in certain fields might predict legal aptitude better than the whole undergraduate average. The highest correlations were with the major field, social sciences, economics, physical sciences, and mathematics. Languages and philosophy produced low figures.

Acknowledgment is made for the aid of Mr. Daniel G. Dittmer and Miss Ina Berginn. [15 min.]

PROGRAM: VISUAL PHENOMENA

WEDNESDAY, SEPTEMBER 2, 1:30 P.M.

14 SILSBY

WALTER S. HUNTER, *Chairman*

Dark Adaptation in a Vertebrate Eye as Determined by the Electrical Response of the Retina. LORRIN A. RIGGS, Clark University.

During the process of dark adaptation the eye becomes increasingly sensitive, so that less and less light is required to elicit a response from the organism. In the conventional threshold determinations of sensitivity only one level of response has been measured. With the retinal response technique, however, it is possible to register any magnitude of response. One may therefore obtain by this means a more complete as well as a more direct picture of the course of dark adaptation in the retina.

Frogs of the species *Rana pipiens* are used. Curare is injected

to paralyze the skeletal musculature. No further operation is necessary with this preparation. Photographic records are made of the potential developed between the cornea and a neutral point on the body.

A period of light adaptation is first given. Then short flashes of light of various intensities are given at intervals during subsequent dark adaptation. The magnitude of the response to these flashes may be plotted as a function of time in the dark. From this plot are derived curves showing the intensity of flash necessary to produce a given height of response at any time in the dark.

The shape of this curve of dark adaptation is dependent upon the particular height of response chosen as constant effect. This finding renders doubtful any inference which we might wish to draw regarding an underlying chemical reaction. Furthermore, the shape of the curve depends upon both the intensity and the duration of the preceding light adaptation, a circumstance which is interpreted as confirming Wald's hypothesis of a complex visual cycle. [15 min., slides.]

A Curve of Flicker Fusion Speeds for the Cat. W. E. KAPPAUF,
JR., University of Rochester.

A curve which describes the relationship between brightness and the limits of flicker discrimination has been determined for the cat. The series of flicker thresholds, upon which the curve is based, was obtained in the simple lever-pressing discrimination situation previously described.

The animals were observed under conditions favoring dark adaptation. Discrimination distance was not fully controlled. Eye and head movements were unrestricted. Each animal was run 20 trials per day, several hundred trials being required for each threshold determination. Except at the lowest brightness levels where performance was highly variable, transfer was immediate from one brightness level to another and from one flicker speed to another.

Previous behavioral studies of flicker perception in infra-human species have provided data on dragon-fly larvae (Sälzle, 1932-33), bees (Wolf, 1933), fighting fish (Beniuc, 1933), and sunfish (Wolf and Zerrahn-Wolf, 1936). As compared with the curves of flicker fusion for the bee and the sunfish, that for the cat has a much smaller slope. It is also located several log units lower on the brightness scale than are the curves for these other species. These facts indicate that, as observed in the present situation, the sensitivity of

the cat's eye to intermittent stimulation is greater than that of the invertebrate or vertebrate eyes found in the bee or sunfish.

The curve for the cat has also been studied in relation to curves obtained on human subjects tested under various conditions in the same experimental situation.

This experiment was conducted in the Psychological Laboratory of Brown University. [15 min., slides.]

The Effect of Scattered Light on the Sensitive Elements of the Retina. THEODORE KARWOSKI, Dartmouth College.

This study was undertaken in order to measure the effect of scattered light on the light sensitive areas of the retina. The experimental procedure consisted of projecting light on the blind spot or optic disk and then determining the threshold for light on adjacent part of the retina. Since the optic disk does not contain rods and cones it was assumed the effect on the threshold of the test light would be a result of the light scattering from the optic disk. It was thought that in this way a critical experiment might be done as a check on much work in vision involving situations in which thresholds for light are compared with thresholds obtained in the presence of an auxiliary light. The results obtained were surprising. It was found that the presence of a light on the optic disk had an inhibitory effect or increased the threshold for light on an adjacent area. The increase in threshold is proportional to the intensity of the light on the optic disk. Other experiments were performed in order to determine the bearing of scattered light from the optic disk on color contrast. These experiments were performed in collaboration with Dean Nicholson of Dartmouth College. [15 min., slides.]

An Experimental and Theoretical Study of Changes in Surface Colors under Changing Illuminations. HARRY HELSON, Bryn Mawr College, and DEANE B. JUDD, National Bureau of Standards.

If changes in illumination are sufficiently great, surface colors may become radically altered (color conversion). In the experiments 18 samples covering all hues and a wide range of lightnesses and saturations were examined under 25 different illuminants, on white, gray, and black backgrounds. Total number of colors was thus 5,400 for each observer. Judgments of hue were in terms of

an eight-part division of the hue circuit and of lightness and saturation on a scale from 0 to 10. Weakly or moderately selective illuminants with respect to wave length leave surface colors relatively unchanged (color constancy), but a highly selective illuminant may make two surfaces which appear different in daylight indistinguishable, and surfaces of the same daylight color widely different.

Prediction of the changes found in color conversion has been quite successful by means of a quantitative theory based on knowledge of the spectral energy distributions of the illuminants, spectral reflectances of the samples, the properties of the 'normal observer,' and certain assumptions regarding shift of achromatic point for each sample under each illuminant. The greater color inducing effect of black ground on all samples, the tendency of light samples to take on the hue of the illuminant plus yellow while dark samples tend toward the complementary hue plus blue, and certain other qualitative effects are predicted by the theory. Several deductions from the theory, some remaining to be verified by experiment, will be presented. [15 min.]

The Effect of Size of Surrounds on Visual Acuity in the Fovea.

M. BRUCE FISHER, Yale University.

Monocular acuity in a 2° foveal area, at retinal illuminations of .06, 3.1, and 100 photons, was measured with an Ives-Cobb grating. Annular illuminated surrounds varying in radial width from 2.5° to 20° of visual angle immediately surrounded the test area. These varied in retinal illumination from .02 to 2,686 photons.

Under the conditions of the experiment, with increase in the size of surrounds from 2.5° to 20° , acuity decreased when the surrounds were brighter than the test area, and remained approximately constant when surrounds and test area were of equal brightness. Acuity increased when the surrounds were dimmer than the test area. These results are of use in evaluating the possible mechanisms of interaction in the retina. [15 min., slides.]

An Objective Study of "Cyclotorsion." W. C. BEASLEY, U. S. Pub.

Health Survey, and R. H. PECKHAM, Temple University School of Medicine.

The rotation of stereoscope-objects about the visual axes eventually produces diplopia. The classical explanation is one of limited

eye-ball torsion about the same axes. The angular tolerances of six subjects (803 trials) was about $\pm 10^\circ$ near the vertical meridians and $\pm 3^\circ$ near the horizontal. Short radii permitted greatest rotation. Stereopsis was reported in all but the horizontal meridians. Simultaneous telescopic observation showed no torsion of the eye-ball.

Analysis of the disparity into horizontal and vertical components showed these to be limiting factors. Stereopsis was proportional to the horizontal component only. Stereoscopic photographs of an inclined rod in the median plane showed comparable rotation of the objects and similar stereopsis.

It is concluded that cyclophoria, cyclotorsion, and cyclofusional amplitude have no meaning, that binocular fusion of rotated objects depends upon the horizontal and vertical disparities, and that stereopsis is dependent upon the horizontal disparity. [10 min., slides.]

The Anchoring of Absolute Scales. JOHN VOLKMANN, Harvard University.

In making a certain type of absolute judgment, the observer is instructed to judge with reference to the particular stimuli being presented in the experiment at the time. Under these conditions, the position and the length of the observer's absolute scale are definite functions of the stimulus-group which is presented. The scale is then said to be *stimulus-anchored*. But the scale may be anchored by determining agents other than the stimuli. What are these other anchoring agents?

An inclined line of light was exposed in a dark box for one second in every eight seconds. The experimenter set the line at different inclinations; the observers judged inclination in six absolute categories, the integral numbers *one* to *six*. There were six stimulus-inclinations, the lowest being 40° and the highest 50° above the horizontal. Thresholds between adjacent categories were obtained by graphical treatment of the frequencies of judgment. Each experiment consisted of a control series, and an experimental series in which the instruction was altered.

The first experiment examined the possible anchoring effect of a definite, reproducible value, designated by instruction but not presented as a stimulus. The horizontal is an example of such a value. In the experimental series the observers were instructed that the horizontal was to define their category of judgment *one*. The results show clearly an anchoring effect: the scale shifts and extends

in the direction of the horizontal. A further finding is that the extension is not complete; the scale of judgment does not actually reach the horizontal.

The second experiment demonstrated in a similar manner that any value which the observer selects and holds in mind can exert an anchoring effect. The scale extends toward the value which the observer has selected; again the extension is not complete. [15 min., slides.]

Observational and Mathematical Differences in Bar Graph and Volume Situations. JAMES L. GRAHAM, Lehigh University.

Normative investigations of illusory trends in complex fields should increase skills in meeting practical situations, and decrease speculations based upon over-simplified situations.

Such a study was made with judgments of bar length for 88 different bar graphs and with 87 volume comparisons. In the bar graph analysis, six variables were analyzed: horizontal or vertical mode of presentation, coarseness or fineness of the scale units, spacing distance between the bars, width of bars, bar length, and nearness or remoteness from the scale. The factors compared were either equated in identical comparisons or in groups where the factors and degrees were equated but not in identical combinations of degrees. The probability of a trend holding consistently was expressed in terms of its ratio to the standard deviation of the difference. While the multi-dimensional set-up precluded a conclusive answer to some of the problems raised, it indicated that a maximum illusion toward over-estimation would be expected by selecting data to give short bars, presented with narrow bars, wide spacing distances, coarse scale units, vertical presentation for relatively long bars and horizontal presentation for short bars, and remote bar position from the scale.

Volumes were analyzed for the influence of length and width, form, disparity in size, and for subjective judgments of familiar liquid measures. For relatively smaller objects, the cubical forms were typically over-estimated and the spherical under-estimated. In cylindrical forms, over-estimation was in the direction of the wider diameter. In subjective judgments, relatively smaller measures were under-estimated and large over-estimated.

Trends found in over-simplified situations need experimental verification before applying uncritically to complex situations. The determination of critical limits within which rather uniform illusory trends can be expected to hold is required. [15 min., slides.]

PROGRAM: ABNORMAL PSYCHOLOGY I

WEDNESDAY, SEPTEMBER 2, 2:00 P.M.

105 DARTMOUTH

MARK A. MAY, *Chairman*

An Experimental Test of One Phase of The Hypothesized Repression Sequence. ROBERT R. SEARS, Yale University.

According to the repression hypothesis (cf. Sears, *Psychol. Bull.*, 1936) a sequence of acts accompanied by the ego (competitive) drive is susceptible to repression providing the drive is frustrated. The fact of failure at a competitive task satisfies this condition. Such a procedure is presumed to establish antagonistic anticipatory responses which, on subsequent attempts, will be in conflict with, and will block, the sequence of acts. Two indirect tests of the establishment of these antagonistic anticipatory acts were provided in the following experiment. Twenty subjects were divided into 2 paired groups on the basis of preliminary practice trials at learning comparable lists of nonsense syllables and at card-sorting. Each subject was then given 15 trials at card-sorting on each of 3 days, preceded and followed on each occasion by the learning of a list of 10 nonsense syllables by the method of anticipation. The 2 groups of subjects were differentiated by their "success" or "failure" at card-sorting. These conditions were produced by false statements concerning the S's performance on each trial in comparison to his own past performances and those of others in the group. Success or failure reactions were strong in all but 2 cases. Results: (1) the *success* group showed a greater gain in learning trials in the post-card-sorting learning over the pre-card-sorting learning than the *failure* group—indicating in the latter the presence of responses antagonistic to activity temporally associated with the competitive activity. (2) The *success* group showed increased speed of card-sorting from the first to fifteenth trials on each of the 3 days while the *failure* group showed decreasing speed—verifying the predicted tendency for the sequence of acts to diminish in efficiency in the frustrated group. [15 min.]

A Quantitative Study of Certain Changes Occurring Under Sodium Amytal. JAMES W. LAYMAN, Psychopathic Hospital, State University of Iowa.

The present study deals with the measurement of changes in the performance of schizophrenic patients on a series of psychological tests while under the influence of sodium amyta. The Stanford-Binet, Bernreuter, Rorschach, Performance and Motor tests were administered before, during and after the influence of the drug.

Previous studies have emphasized the qualitative changes which frequently accompany the administration of sodium amyta. Concomitant with this change the inhibitory factors which interfere with the communication of repressed materials may temporarily be removed, making it possible to study the thought processes of patients who previously had been uncommunicative. The present work is concerned with a quantitative measure of the changes involved, as they can be studied by the battery of tests employed.

The results obtained show statistically reliable differences during the period of the drug effects as compared with the other two performances, indicating that the temporary alteration of the primary symptoms also produces a change in certain of the secondary characteristics of the disease process. The Stanford-Binet shows an increase in mental age and a reduction in the "scatter" of performance on the sub-tests; the Bernreuter shows changes in the direction of extraversion; with the Rorschach there may be either a reduction or an increase in responses along with improved "organization" scores, agreeing with the improved mental age of the Stanford-Binet; Performance tests produce decreases in both time and moves; Motor tests show improved coördination. [15 min.]

The Effect of Sodium Phenobarbital on the Learning of Rats.
GRIFFITH W. WILLIAMS, University of Rochester.

As phenobarbital is one of the commonly used hypnotic drugs it becomes necessary for abnormal psychology to know its effects on learning. A group of rats was used for this purpose, the litter mates being divided into drugged and control groups. A dose of .087 gm. per kg./body-weight was injected intraperitoneally during the course of the learning and relearning and also during a period of six weeks of forgetting. There is a marked and consistent tendency for the drugged group to be inferior in both the learning and relearning when measured by both time and errors. This is

not due to lethargy. The retention of the drugged group is, however, as good as that of the control group. [10 min., slides.]

The Effects of the Sympathomimetic Drug Benzedrine on the Viscera and the Mood of Man. ABRAHAM MYERSON, from the Division of Psychiatric Research, Boston State Hospital, Mattapan, Mass., aided by funds from the Commonwealth of Massachusetts and the Rockefeller Foundation.

Benzedrine is a derivative of the adrenalin group of drugs and its chemical constitution is Beta-Phenylisopropylamine Sulphate. It differs from adrenalin pharmacologically in that it is slower and more prolonged in action and can be administered orally.

It has a very marked effect upon those spasms of the gastrointestinal tract which are created by emotional and functional nervous states. These spasms can be demonstrated by X-ray examination of stomach and intestines and are probably of parasympathetic origin; that is, the autonomic balance is disturbed in the direction of parasympathetic over-stimulation. A few tablets (20-30 mg.) of benzedrine will completely relax the spasm temporarily, and given over a period of time the spasm will be abolished.

Most interesting is the effect on sleep. The disease narcolepsy, which is characterized by the appearance of drowsiness and attacks of sleep under emotional stress, is completely relieved by the continued use of benzedrine. Normal sleep is completely abolished by benzedrine taken within a few hours of the sleep time. The emotional state associated with this insomnia is not unpleasant.

Very interesting and favorable results are obtained in a good many of those normal and quasi-normal states in which the individual who has not had sufficient rest and who is somewhat depressed in the morning uses this drug. A few milligrams of benzedrine taken two or three times during the morning has an excellent temporary effect upon the state which is compounded of fatigue and depression so commonly experienced and which is characteristic in extreme degree of the severe neuroses.

One or two cases are cited in which suicidal thought, extreme depression, and the anhedonic state are remarkably influenced by benzedrine. [15 min., slides.]

Salivary Secretion Under Hypnosis. ARTHUR JENNESS, University of Nebraska.

Nevsky and Levin have reported that in a nine-year-old child salivary secretion accompanying the eating of various foods was

approximately the same during hypnosis as in the waking state. The writer and Ray C. Hackman, using a device which delivers liquid stimuli inside the mouth without warning, found that the parotid secretion of four college students in response to lemon juice averaged 44% less during 'sleeping' (lethargic) hypnosis than during waking. (Difference/ σ difference=12.00.) One non-hypnotizable subject showed no significant decrease when simulating hypnosis. Posthypnotic secretions at given signals, resulting from direct suggestion under hypnosis, similar in all respects to conditioned responses, were obtained in several subjects. Improved apparatus for stimulating and recording human salivary responses will be described. Results will be discussed in relation to other studies of reflexes under hypnosis. [10 min., slides.]

Relationships Between Waking Suggestibility and Hypnotic Susceptibility. LESTER F. BECK, University of Oregon.

The purpose of this study was to determine whether hypnotizability can be detected in certain responses executed in the waking state.

Eight tests of waking suggestibility, an hypnotic index, and the Bell Adjustment Inventory were administered to twenty-five men and twenty-five women. The tests of waking suggestibility included a modification of Chevreul's pendulum, an electric shock test, measures of hand steadiness, arm sway and body sway, and eye-lid closure following optical fixation, auditory fixation, and verbal suggestion. The hypnotic index contained ten qualitative items such as eyelid catalepsy, cutaneous anesthesia and execution of post-hypnotic suggestions. Each test was given twice during an initial test series, and a re-test followed within three weeks.

With one exception the reliability coefficients of the tests for a single test series exceeded +0.87, as estimated by the Brown-Spearman formula. Retest reliability coefficients were consistently lower, ranging between +0.44 and +0.88. The correlations between the hypnotic index and the various suggestion tests ranged between +0.36 and +0.90, with a median coefficient of +0.58. The correlation with the adjustment inventory was +0.29. These results show that with certain tests of waking suggestibility it is not only possible to detect hypnotizability, but to predict the "depth" of hypnosis with considerable accuracy. Personality tests, however, such as the Bell Inventory, shed little light upon a person's susceptibility to hypnosis. This experiment was done with the assistance of Mr. Ben Saltzman. [15 min.]

PROGRAM: INFANT BEHAVIOR

WEDNESDAY, SEPTEMBER 2, 2:00 P.M.

13 CARPENTER

JOHN E. ANDERSON, *Chairman*

Quantitative Measures of Developmental Processes in Erect Locomotion. MYRTLE B. McGRAW, The Babies Hospital, New York City.

Quantitative data dealing with the development of erect locomotion in infants have usually been of the order of calculating the mean chronological age at which the child makes his first independent step, the number of steps, or distance covered before losing balance, etc. Significant aspects of locomotion such as changing base width, pressure contacts, associated movements, and shifts from isolated to integrated movements have been expressed in descriptive terms.

The moving picture has had extensive use as a recording device. As a measuring instrument it has even greater promise for laboratory application, especially in studies of motor development. Shifts from isolated to integrated movements can be calculated by counting frames registering movements of different bodily parts. Pressure points, base width, and associated movements can be measured with precision. Many aspects of development which are usually considered qualitative can be calculated in definite quantitative terms. [10 min.]

Sucking Responses and Related Behavior of Infants. H. M. HALVERSON, Yale University.

Sucking responses of male infants together with concomitant body tension and other related behavior were recorded kymographically.

Sucking responses of bottle babies were recorded by means of specially constructed nipples which communicated with a mercury manometer. Two kinds of nipples were used; one yielded milk easily and one yielded milk only under strong suction. Muscular tension was measured by means of gripping pressure. A small silk-covered rubber capsule within the palm of the infant communicated

hydrostatically with a second mercury manometer. Floats in the two manometers recorded suction and gripping pressure on the kymograph. Sucking reactions of breast babies were secured by slight alterations in the sucking apparatus.

The baby was completely undressed for the experiment. Before feeding began the kymograph was started and records were taken of body posture and of muscular tension as revealed by gripping. The record was then continued under conditions wherein the baby obtained (1) nourishment easily, (2) nourishment only by strong sucking, and (3) no nourishment with sucking. At predetermined points during the sucking intervals the nipple was removed for a given time and then replaced in the infant's mouth.

The results include differential responses to breast feeding; to dry-sucking, easy sucking, and difficult sucking at the bottle; and to removal of the nipple.

The order of preference in sucking is as follows: breast, easy nipple, difficult nipple, dry nipple. Emotional disturbances, marked changes in posture and muscular tension, and frequent tumescence accompany frustration. Detumescence occurs when nourishment is easily obtained and is accompanied by reduction of physical activity.
[15 min., slides.]

Conditioned Feeding Responses in Young Infants and Concomitant Behavior Changes. RUTH WILDERBERG KANTROW, Iowa Child Welfare Research Station.

Feeding responses of sixteen infants, ranging in age from six to fourteen weeks, were conditioned to the sound of a buzzer. Objective records of sucking and protocols of behavior were made. The report deals with an analysis of the formation of stable conditioned responses and concomitant behavior changes. In addition, studies were made of experimental extinction and the retention of the conditioned response. As far as was possible, the infants were used at four feeding periods during the day until the conditioned response was stable. Three to eleven experimental feedings containing 16 to 72 paired stimulations were necessary for the establishment of stable conditioning.

Behavior protocols included notations of the degree of general body activity and crying. Analysis of these protocols demonstrates that the acquisition of the conditioned reflex was associated with a distinct change in the behavioral pattern. The anticipatory nature of the conditioned feeding response was shown by the fact that its

acquisition proceeded in a forward direction, the response appearing closer to the onset of the buzzer.

Analysis of individual feeding periods indicated that during the last third of the feeding period, when hunger had been more or less sated, the strength of the conditioned response diminished considerably. The strength of the conditioned feeding response bears an inverse relationship to the degree of hunger satiation.

The records of experimental extinction demonstrated that four to twelve single stimulations were necessary to extinguish the response. Concomitant behavior is shown to change in a distinct pattern. Conditioned feeding responses were retained up to seventy-two hours. [15 min., slides.]

Infant Development Under Minimum Social Stimulation. WAYNE DENNIS, University of Virginia.

The purpose of this experiment was to determine whether or not the development of infant behavior will follow its normal course in the absence of the usual social stimuli, such as the fondling of the adult, the adult's interest in new actions and his encouragement or discouragement of these actions and his attempts at teaching. To this end two infants were reared under laboratory control for the first thirteen months of life with every provision for their physical wants but under conditions of semi-isolation. The experimenter attempted to exercise the minimum of handling, of reward, and of punishment, and tried as far as possible to leave each infant to its own devices in the matter of behavioral development.

The infants thrived under the conditions of the experiment, and were happy, healthy, and active. In order to obtain comparison data on children reared under the usual home conditions, the experimenter has reduced to graphical form the first year of development of fifty infants which have been the subjects of baby biographies. A comparison of the experimental subjects with these control cases shows that the semi-isolated infants developed all of the typical responses of the first year, and that each of these responses appeared within the usual age-period for its manifestation in normal children. These responses include such things as laughter, timidity, manual play, playing with the toes, vocal greeting, pulling to sitting, etc. Other considerations lead to the conclusion that these new activities do not occur instinctively, but develop through the child's own activity with only the very minimum of stimulation from adults. [15 min.]

Spontaneous Play Activities of Five Year Old Children. HELEN THOMPSON, Yale University.

The infants of the Yale normative study of infancy have been reexamined at the age of five years to ascertain the prognostic significance of their infant behavior. The examination at the age of five years included a fifteen-minute period of free play in a room equipped with a standardized arrangement of seven simple but varied toys. The child was told that he might play with them in any way he wished. Two observers, one in the room with the child, the other behind a one-way vision screen, recorded the sequence, duration, and type of play in which the child engaged. Data were secured for 59 subjects, 27 boys and 32 girls. The present report discusses the nature of the play, individual and sex differences, and the significance of the play pattern in terms both of the infant and of the five year old child. [15 min., slides.]

PROGRAM: RESEARCH AND INSTRUCTIONAL FILMS

WEDNESDAY, SEPTEMBER 2, 7:30 P.M.

105 DARTMOUTH

CLARK L. HULL, *Presiding*

Quantitative Measures of Developmental Processes in Erect Locomotion. MYRTLE B. McGRAW, The Babies Hospital, New York City. [4 min.]

Conditioning in Young Infants. RUTH WILDEMBERG KANTROW, Iowa Child Welfare Research Station. [10 min.]

Factors in Visual Depth Perception. F. N. STANTON, The Columbia Broadcasting System. [12 min.]

Eye Movements in Reading. WILLARD L. VALENTINE and MAURICE E. TROYER, Ohio State University. [12 min.]

Overt Behavior Accompanying the Conditional Salivary Response. Karl Zener, Duke University. [16 min.]

The Postoperative Effects of Removal of the Striate Cortex upon Certain Aspects of Visually Controlled Behavior in the Cat. LEONARD CARMICHAEL and KARL U. SMITH, University of Rochester. [17 min.]

Effects of Mescaline on Monkeys. HEINRICH KLUEVER, Otho S. A. Sprague Memorial Institute. [18 min.]

Reactions of a Cortically Blind Monkey. HEINRICH KLUEVER, Otho S. A. Sprague Memorial Institute. [18 min.]

Gestures Used by Chimpanzees in Coöperative Problem Solving. MEREDITH P. CRAWFORD, Yale University. [10 min.]

Some Aspects of Social Behavior in Chimpanzee. M. P. CRAWFORD and H. W. NISSEN, Yale University. [8 min.]

The Startle Pattern. WILLIAM A. HUNT, Connecticut College for Women and CARNEY LANDIS, New York State Psychiatric Institute. [12 min.]

A Demonstrational Film of Apparatus and Procedure Used in the Study of Problems of Human Motivation. ANTHONY J. MITRANO, Yale University and Vineland Training School. [3 min.]

PROGRAM: CORTICAL FUNCTION

THURSDAY, SEPTEMBER 3, 9:00 A.M.

105 DARTMOUTH

KARL S. LASHLEY, *Chairman*

Further Studies on the Effect of Lesion Shape on Behavior. N. R. F. MAIER and M. V. SABOM, University of Michigan.

Previously it was reported that elliptical cortical lesions with the long axis in the anterior-posterior direction were less destructive to problem-solving in rats than round lesions of equal mass.

Two explanations for this phenomenon suggest themselves. A. Round lesions interrupt more anterior-posterior association fibres than elliptical lesions with the long axis in the anterior-posterior direction. B. Differently shaped lesions have different dynamic properties.

To test these two explanations, one group of 33 rats was subjected to round lesions, and another group of 27 rats was subjected to elliptical lesions with the long axis in the medial-lateral direction.

If the first alternative were correct, the second group should show the greater deterioration, whereas if the second were correct the first group should show the greater deterioration.

Since the ratio of width to length of lesion cannot be made as great as the ratio between length to width, the lesions in this study do not show as great a range in lesion ratio. The results, however, show that the 33 rats with lesion ratios (W/L) between .8 and 1.3 had an average destruction of 24.7% and made a score of 85.9% before and a score of 46.8% after the operation. The reduction in score was 45.5%. On the other hand, the 27 rats with lesion ratios between 1.4 and 3.8 (av. 1.7) had an average amount of destruction of 26.2% and made a score of 86.8% before and 57.2% after the operation. The reduction in score was 34.1%. This difference in deterioration corresponds in magnitude to that found in the previous study, indicating the importance of lesion shape irrespective of the direction of the larger axis. [15 min., slides.]

Brain Mechanisms and Versatility. I. KRECHEVSKY, University of Chicago.

This is the third of a series of experiments which took as its program the investigation of the function of the cortex in the more fundamental processes involved in learning. Thus our first report (1934) dealt with the "hypothesis-behavior" of the operated rat, our second report (1935), with the attentive processes, and the present report deals with the ability of an operated animal to show versatility in his behavior.

To determine the effects of cortical injury upon this capacity, six measures of variability were obtained on 69 operated and 68 normal rats in three different test situations. One of these tests (Dashiell's checker-board maze) provided the animals with an opportunity to display fifteen different responses within the framework of one generalized solution. The other two tests were "pure" tests of versatility ("free-choice" situations) and involved no learning. The effects of relatively minor lesions were studied in these experiments.

On the basis of the records of these 137 animals the following conclusions are suggested: (1) An animal with a cerebral lesion shows a decided loss in the ability to adopt a simple generalized response, where such a response is essential for efficient performance; (2) Within this generalized response, the operated animal suffers a loss in the variety and plasticity of the solutions possible; (3) In situations where no learning is involved, the operated animal also shows a decided loss in versatility; (4) The impairment in these behavior capacities seems to be independent of the locus of the lesion, and dependent on the size of the lesion; and finally (5) Such impairment is a consequence of relatively minor lesions.

Some theoretical considerations of the rôle versatility plays in the learning process are discussed in the light of the above conclusions. [15 min., slides.]

The Postoperative Effects of Removal of the Occipital Cortex upon Visual Acuity in the Cat, as Measured by Oculo-Cephalo-Gyric Responses. KARL U. SMITH, University of Rochester.

The present paper reports results bearing upon the visual acuity of the cat following complete bilateral extirpation of the striate cortex. Measurements of visual acuity were made by means of an apparatus which elicited compensatory movements of the head and eyes in response to a rotating striated pattern. Four different patterns were employed, consisting respectively of lines 5.0 cm., 2.5 cm., 0.6 cm., and 0.16 cm. in width. No lines smaller than 0.16 cm. in width were used. In every case a distance of 50 cm. intervened between the animal's eyes and the test stimuli. All observations were made under conditions of high illumination.

Three animals with complete bilateral removal of the occipital cortex exhibited compensatory reactions of the eyes and head to rotation of the different striated patterns. The responses to the lines 5.0 cm. in width were observed two days after the operation in the case of one animal, and as the lines were reduced in width on subsequent days thereafter similar responses were found. The experiments were made three months after the operations with the two additional animals.

Under the conditions described, the smallest striations employed subtended a visual angle of 11.0 minutes. Accordingly, the visual acuity of the cat may be said to be at least 11.0 minutes of arc following removal of the occipital cortex. The significance of such visual capacity in cats lacking the cortical connections of the optic system is discussed.

This experiment was conducted in the Psychological Laboratory of Brown University. [15 min., slides.]

The Effect of Complete and Partial Bilateral Extirpation of the Area Striata on Visual Movement Discrimination in the Cat. JOHN L. KENNEDY, Yale University.

The present paper describes experiments concerning the effect of partial and complete extirpation of the visual cortex in the cat upon thresholds of real movement discrimination. Two movement acuity

thresholds were found before operation: (1) "absolute" thresholds (6 animals) determined by training the animals to discriminate between a moving and a stationary cross and subsequently reducing the speed of the cross; (2) "relative" thresholds (4 animals) found by utilizing a standard velocity and slowly increasing the speed of a slower stimulus to approach the standard.

In three animals of the first group, the area striata was incompletely removed and in the remaining seven subjects this area was completely extirpated. The three animals with partial lesions discriminated immediately after post-operative training began. The "absolute" thresholds of these subjects were greatly modified.

Animals with complete lesions were given 1,000 to 2,000 post-operative trials. All the cats showed some residual capacity for differentiating between a moving and a stationary pattern. Their behavior differed from the behavior of animals with partial lesions, in that 300 to 500 trials were required before any type of movement discrimination could be elicited and their discriminatory behavior was extremely variable throughout post-operative trials. In three of these animals discriminations could be obtained when the stimuli (crosses) used in the pre-operative training were presented. However, in two additional animals discriminative responses could be demonstrated only with moving patterns less complex than crosses.

The significance of the results is discussed in relation to theories of cortical visual function.

These experiments were carried out in the Psychological Laboratory, Brown University, in collaboration with Dr. K. U. Smith. [15 min., slides.]

Restitution of Function After Cortical Injury in Monkeys. C. F. JACOBSEN, Yale University.

Recovery of function after cortical injury will be considered in relation to three experimental variables: age of subject, kind of function involved, and magnitude of lesion. Clinical and experimental evidence indicates that the effects of cortical injury are less severe in infants than in adults. Thus Kennard has shown that the paralysis following motor-premotor injury in infants is of slight duration in contrast to the profound and permanent impairment of voluntary movement in adults. Although there is some permanent disturbance of movement and posture, the infant monkey is able to walk, run, climb and manipulate objects with tolerable skill.

Destruction of the frontal association areas yields quite different results. Complete ablation in adults is followed by permanent impairment of capacity for delayed response, and in contrast to the considerable recovery after motor injury, equally severe deficit follows ablation of the frontal areas in infant monkeys. It seems probable that this difference in recovery after lesions of the motor and frontal regions can be resolved in terms of partial and complete destruction of dynamic systems. Thus ablation of the motor region removed only the cortical component of the postural and lacomotor system and in this instance the age of the subject was important in determining the degree of recovery. For the frontal region, however, the absence of alternative cortical or subcortical mechanisms appears to preclude restitution of function and age of the subject at time of injury is of little consequence. Experiments with subtotal lesions of the frontal region in adults will be considered. These experiments have been carried out in collaboration with Doctors G. M. Haslerud and F. V. Taylor. [15 min., slides.]

Methodology for Brain-Intellection Studies in Man. HAROLD M. HILDRETH, Syracuse Psychopathic Hospital.

Experimental work on the relation between brain and intellection in infrahumans has resulted in a definite method of approach (Lashley and others). An attempt to study this relationship in man, experimentally, likewise brought methodologic considerations. Although it utilizes different techniques, the method evolved has proved quite similar in structure to that employed in animal studies. This similarity (1) allows integration of human and infrahuman findings, (2) provides complementary research methods each having specific limitations and advantages, (3) suggests possibilities in technique and orientation for all problems in which one variable is essentially physiologic, the other psychologic.

The method is described briefly, and principally from the standpoint of its relation to animal methods. (1) Physiologic changes. In lieu of systematic surgical brain destruction, utilization is made of pathologic conditions known to produce specific organic brain changes. Extent and locus of lesions can be dealt with as variables by means of pathologic, individual, and statistical isolation. It is imperative to avoid clinical and diagnostic categories. (2) Psychologic changes. In lieu of maze performance, many specific tests (not quotients) of retention and immediate learning capacity are used.

The form, nature, and difficulty of these tests requires special attention.

In summary, degree and location of brain changes in relation to degree and character of intellective changes may be studied by similar methods in human and infrahuman subjects. With animals the physiologic variable allows greater control and manipulation than the psychologic variable. With human beings the reverse is true.

Experimental work using this approach will be reported later. A few major findings are presented here. [15 min.]

PROGRAM: SOCIAL PSYCHOLOGY

THURSDAY, SEPTEMBER 3, 9:00 A.M.

13 CARPENTER

J. McKEEN CATTELL, *Chairman*

The Experimental Modification of Ascendant Behavior in Preschool Children. MARJORIE LOU PAGE, Iowa Child Welfare Research Station, State University of Iowa.

What effects will training designed to increase self-confidence have upon ascendant behavior?

Two main types of behavior are included in the concept of ascendancy. They are: (1) the pursuit of one's own purposes against interference and (2) the control of the behavior of others. A combination observational-experimental technique was used to measure the behavior. Two children were paired in a situation and provided with materials to encourage almost constant interaction. Manifestations of ascendant behavior were recorded for each child in five such pairings. Seventy-three children served as subjects in the various parts of the study.

Fourteen three- and four-year old children received training designed to increase their feelings of self-confidence. This training consisted of providing them with certain skills connected with play materials and then giving them opportunity to display their advantage when paired with children who had not had the training. Manifestations of ascendancy were markedly increased following such training in both non-ascendant and moderately ascendant children. The children who were originally least ascendant became as ascendant as the average of their groups.

The effects of training appear to be cumulative, with feelings of self-confidence increasing throughout the training series. Non-trained companions who were frequently placed in disadvantageous positions showed losses in ascendance scores. Some evidence indicated that the effects of these training procedures were transferred to ordinary preschool situations. [15 min.]

Learning in the Collective Situation. HERBERT GURNEE, Western Reserve University.

The problem was to compare the learning performance of persons operating in a group with that of persons operating alone. The apparatus consisted of a large visual maze. On the face were many rows of brass bolts, thirty-one of which were wired in an irregular pathway. S contacted the bolt heads with a stylus. A white light indicated the right path, a red light errors. Twelve groups, averaging 10 members each, went through the maze by plurality votes. Six trials were given. Then each group member was given an individual trial to determine how much he had profited by the collective action. Forty-two other Ss were put through the maze individually. The groups, by plurality votes, averaged .16 errors on the sixth trial; the independent Ss averaged 3.9 errors. Only 2 independent Ss equaled or exceeded the group average. The group members on the seventh trial (individual) averaged 4.4 errors, the independent Ss 3.5 errors. But the median errors were 3 and 4 respectively. Most of the subjects evidently learned in the collective situation as well as or better than they would have learned working alone. Correlations have been determined with intelligence and with scores on the Bernreuter Personality Inventory. Position in the group was of only slight significance. [15 min.]

The Psychology of the Speaker-Hearer Relation. EDWARD L. THORNDIKE, Teachers College, Columbia University.

The function of language is to cause responses in the hearer, the revelation or "expression" of the speaker's state of mind being secondary and mediate. The linguistic tools used in any circumstances depend upon extremely delicate and complex systems of connections in the speaker. The potencies of what is spoken depend upon equally elaborate systems of connections in his hearers.

The speaker will in general be led by the law of effect to modify sounds, words and locutions toward ease and brevity, subject to control by his success and failure in producing the desired responses in hearers, and in avoiding shame or ridicule. Evidence will be presented from what happens when nouns are used as verbs.

The speaker may also be influenced by a force somewhat like that of the refractory phase, to avoid too frequent repetition of the same sound, word, or locution. This will be satisfying or annoying to hearers according to the substitutes used. Evidence will be presented in extension of that recently brought forward by Zipf. [15 min.]

Attitude Stability in Older Adults. IRVING LORGE, Institute of Educational Research, Teachers College, Columbia University.

The Thurstone Attitude Scales to 15 different institutions and the I.E.R. Intelligence Scale CAVD were given to a group of 107 adults made available through the courtesy of the Works Progress Administration, New York City. The two forms of each attitude scale were administered with an interpolated interval of approximately two weeks. The directions for the scales were modified so that each subject recorded for each statement a check to indicate agreement, a cross for disagreement, or a question-mark for doubt. The scales were scored to yield the median check score (Thurstone's recommended score), the median cross score, and the corresponding average scores.

From the total group there were equated two sub-groups of 25 persons on the basis of person to person matching for CAVD score. Group Y ranged in age from 20 to 25 years, Group O were all older than 40 years. In order to test the stability of attitudes in young and equally intelligent older persons, the comparable form reliability was computed for each scale by each form of scoring.

By every comparison the older group was more stable than their younger intellectual peers. Despite the fact that most, if not all the scales, were standardized on college populations, the older persons showed a greater attitude fixity over short periods of time. These facts are experimental verification that older persons have habits, ideas, or other tendencies that are more invariant than in the young, and which may interfere with acquisition of new points of view. [15 min.]

Some Life Foci of Women College Graduates. STELLA WHITESIDE, Merrill-Palmer School.

Forty case studies were made from a random sample of women college graduates. When the statements of these women about themselves and others are classified it is evident that their lives revolve about definite foci. Underlying the focus may be an urge to experience life to the utmost, a desire to live through others, a wish for non-existence, nevertheless, the lines of activity radiate from a com-

mon point. Diet, religious belief, cultural activities, economic comfort, vocation are some of the media through which activities are integrated. College, marriage, or the advent of children seem to have little influence in determining the direction of these lines. The needs arising from early family relationships are apparently the determining factors. Seemingly, women tend to perpetuate the life patterns of their mothers rather than their fathers even when they identify themselves with the father. [10 min.]

A Comparative Investigation of Gestural Behavior Patterns in "Racial" Groups Living Under Different as Well as Similar Environmental Conditions. FRANZ BOAS and DAVID EFRON, Columbia University, and JOHN P. FOLEY, JR., The George Washington University.

The present is a preliminary report of an objective study of the gestural behavior of Jews and Italians, particularly with reference to its possible etiology, whether "racial" or cultural. More specifically, the problem was (1) to investigate the characteristic expressive bodily movements, if any, of each of these groups, and (2) to determine to what factors such patterns might be attributed.

The groups employed were (1) traditional Italians living in "Little Italy," New York City; (2) traditional Jews living in the East Side Ghetto, New York City; and (3) assimilated Italians and Jews, both living in similar "Americanized" environments.

The methods used included: (1) direct observation of gestures in natural situations; (2) sketches made by an artist under the same conditions; (3) motion pictures—studied by (a) repeated observation and judgments of naïve observers, (b) graphs and charts together with measurements and tabulation of the same. The graphs were obtained by projection of the film frame by frame upon paper, marking the position of motile parts, such as wrists, elbow, etc.

The results to date indicate different and fairly uniform gesture patterns in the traditional Italian and Jewish groups, and a lack of such "characteristic" patterns in the assimilated groups. Thus cultural stimulation rather than "racial" descent is operative.

The writers are indebted to Mr. Steyvesant Van Veen for making the sketches mentioned under method No. 2 above. [15 min., slides.]

Sex Differences in Children's Attitudes to Parents. H. MELTZER, Psychological Service Center, St. Louis, Mo.

This study represents an attempt to investigate the problem of sex differences in the emotional attachment of children to their

parents by the use of a method which yields data that have clinical validity and are also susceptible to quantitative treatment. In the method used, the individual free association interview, the child, after practice in "loud thinking," is instructed to speak out the first ten ideas he thinks of in response to the words "father" and "mother." The subjects, 76 boys and 74 girls from grades five to eight inclusive, were carefully equated for economic level, age and intelligence. The more important factors investigated were: (1) parental preferences, (2) specific notions of parents, (3) feeling tone of reactions, (4) degree of repression, (5) level of dependence ranging from overdependence to rejection, and (6) level of socialization.

Illustrative of the findings are: The variations in style of attachment of both sexes are many. In general, boys do more often express a preference for mother and girls for father. Girls more frequently express differential preferences, and more often react to both parents with more pleasant feeling tone. On mental health indices there is no significant sex difference in extent. In direction, girls' deviations tend towards overdependence, and those of the boys tend towards insecurity and rejection. [15 min.]

PROGRAM: CHILD PSYCHOLOGY

THURSDAY, SEPTEMBER 3, 9:30 A.M.

14 SILSBY

FLORENCE L. GOODENOUGH, *Chairman*

An Analysis of Human Gait at the Two Developmental Extremes.

A. DOUGLAS GLANVILLE and GEORGE KREEZER, The Training School at Vineland, N. J.

In a recent paper by the authors, a method was described for the quantitative analysis of human gait. This method was designed to permit quantitative measurement of the component movements and positions, and the manner of organization of these components in the complex act of walking. The present paper reports the results of the use of this method in determining the differences between the gaits of young children just before and after learning to walk without support, and the gaits of normal adults. Marked differences were found in the following characteristics: (1) the amplitude of angular move-

ments at the hip, knee, and ankle joints, (2) the form of the curves showing joint-angle as a function of time, (3) the angle of the trunk relative to the vertical, (4) the width of the base of support, (5) the angle of "toeing-in" and "toeing-out," (6) the duration of the support phase of a single leg, and (7) the temporal relation of movements at different joints. These results demonstrate that marked changes in the "machinery" of walking occur even after the child has learned to walk without support. They provide a basis for determining the neurological factors that may be responsible for the changes in gait that occur in the course of motor-development. [15 min., slides.]

Developmental Sequences in Name Writing. GERTRUDE HILDRETH,
Lincoln School of Teachers College, Columbia University.

Name writing records were obtained for 151 young bright children between the ages of three and six before formal writing lessons had influenced the product. Median writing samples for half-yearly intervals in this age range were obtained by arranging all samples within any age level according to excellence and selecting the medial samples as representative of that particular age interval.

The records show developmental sequences comparable to those for drawing and other psycho-motor skills. These sequences appear to be products of both natural maturation in ocular-motor control and refinements in perception. They reflect informal educative and environmental influences. Since the children examined were fairly homogeneous with respect to ability and background, the steady improvement shown in relation to age demonstrates the influence that the age factor exerts on writing development.

The slides show median name writing samples in the successive age intervals. [10 min., slides.]

A Study of the Aggressive Behavior of Young Children. ILSE FOREST, Bryn Mawr College.

The purpose of the study is to discover what, if any, levels of maturity in the solution of social conflicts are discernible in nursery school children between the ages of two and four. Records of 650 quarrels involving 150 children have been made by trained observers. Thirteen nursery schools are represented: six privileged and seven under-privileged. Family and personal data from nursery school teachers interviews are complete for nine schools, such data eventually to be obtained for all. Sample record cards of quarrels

observed have been made, and 100 edited to determine cause and resolution. Mental tests by fully qualified examiners have been completed for nine of the schools. A tentative scale to show levels of maturity of aggressors and victims in quarrel situations has been made. Madeline Hunt Appel has made or directed all records. [10 min.]

The Laughter of Kindergarten Children. GRACE E. BIRD, Rhode Island College of Education.

Laughter among kindergarten children, observed and recorded over a period of ten years, indicates that laughter at that age is not a social gesture. It is an individual expression of defense against some unusual condition which threatens to submerge thought and cause mental confusion. This theory seems consistent with the self-centered character of the very young child in both work and play.

Sudden changes affecting the individual's preconceived standards concerning the behavior, sound, or appearance of persons and things result in temporary mental maladjustment. Such deviations from the established norms call for immediate attempt at adjustment by means of laughter, which is the child's normal expression of well-being.

Although group laughter develops through imitation among kindergarten children, it appears to have little relation to the original stimulus which brought about the reaction of mirth on the part of the individual imitated. [10 min.]

Children's Criticism in the Light of Piaget's Developmental Theory.

BARBARA STODDARD BURKS, Institute Rousseau, Geneva, Switzerland.

Relations between developmental vectors of verbal attitudes and of conduct were studied in forty children between four and twelve years of age, using experimental situations calling for self-criticism, adult criticism, criticism by a comrade, and criticism of a comrade. Age changes were studied from the point of view of Piaget's developmental theory (*i.e.* egocentrism diminishing under the social influence of coöperation between age-peers). Individual verbal-behavior protocols were investigated for evidence of consistent personality patterning. Developmental stages varied from a primitive incapacity for autocriticism, or for giving or receiving criticism, to a mature capacity to evaluate and assimilate in terms of objective reality. In general, non-verbal conduct showed a slightly more advanced level of develop-

ment than did verbal conduct, but many exceptions occurred. Individual reaction patterns were found corresponding to apparent "traits" of positive and negative social sentiments. [10 min.]

Intracranial Birth Lesion in Identical Twins. KATHERINE PRESTON
BRADWAY, Vineland Training School.

In studies of birth injuries it is difficult to differentiate between that part of an individual's behavior which results from injury and that which is due to native endowment. A study of two pairs of identical twins is presented. One twin of each pair was injured at birth while the other was not. One injured twin manifests severe motor effects but no mental disturbance. The other injured one is mentally deficient but shows no motor disturbance. The study of the non-injured twin as the control and the related injured twin as the experimental subject facilitates the analysis of effects of injury at birth on motor, mental, and social development, and also provides a basis for suggestions relating to the questions of differential influence of heredity and environment on the developing organism. [10 min.]

PROGRAM: HUMAN LEARNING I

THURSDAY, SEPTEMBER 3, 1:30 P.M.

14 SILSBY

ROBERT S. WOODWORTH, *Chairman*

Functional Values at Comparable Points in Learning and Forgetting.
ADELLA CLARK YOUTZ, Yale University.

Jost formulated the first comparisons of associative strength in habits of unequal age. Experimental clarification of his law has been hampered by the fact that the retest involves additional learning of the old habit, thus violating the conditions of Jost's Law by vitiating the comparison of the old habit with the younger habit. This technical difficulty has been overcome by selecting, for the present study of functional values, comparable points in learning and forgetting on the basis of the results on nonsense-syllable learning obtained by Luh and Ward.

Fifteen subjects learned 12-unit nonsense-syllable lists by the anticipation method. Retention curves for the following three degrees of partial learning are plotted: (1) initial criterion of one

complete anticipation; (2) an average criterion of 7 correct anticipations on two successive trials; (3) an average of 4.5 correct anticipations on two successive trials. Each of the 17 points is the mean of at least 30 separate determinations. These curves provide the comparable points for which functional values are calculated.

Functional values, *i.e.* retention, relearning, serial position, and anticipatory intrusions, are presented for the comparable points in learning and forgetting. Implications for the limits of Jost's Law are discussed. [15 min., slides.]

Proactive Inhibition in Serial Verbal Learning as a Function of the Degree of Learning of the First Material. ARTHUR W. MELTON,
University of Missouri.

The study is concerned with the effect of the learning of one serial verbal habit on the rate of acquisition of a second serial verbal habit when the degree of learning of the first habit is varied within wide limits. Lists of 12 nonsense syllables were learned for 0, 2, 5, 10, 20 or 40 trials and second lists were learned to a criterion of 2 successive errorless trials after a rest of 1 minute. Twelve S's were given 3 days of practice in learning nonsense syllables, and were then given the 6 conditions in a counterbalanced order during two cycles. The analysis of the data must be restricted to those obtained during the second cycle (after all S's had served for 9 days) in order to eliminate inequalities among the conditions with respect to general practice effects introduced by the nature of the problem.

Analysis of the data obtained from the well-practiced S's reveals: (1) no evidence for proactive inhibition or facilitation ("warming-up") when measurements are made in terms of the trials required for mastery of the second lists; (2) some evidence for a proactive inhibition during the first few trials of the learning of the second list when the first list was learned for only 2, 5, or 10 trials, with the maximal inhibition when the first list was learned for 2 trials; (3) the proactive inhibition, when present, is definitely transitory, and in the case of the least degree of learning of the first list it has disappeared by the sixth tenth of the total learning period required for the second list, as determined by composite Vincent curves. [15 min., slides.]

All-or-None Versus Gradual Elimination of Culs-de-Sac in Human Maze Learning. JOHN A. McGEOCH, Wesleyan University.

The depth of each entrance into the alleys of a 10-alley Warden U-maze has been measured during learning to a criterion of 3 perfect

successive trials. The subject traced the maze with a pencil-stylus which recorded, on a band of paper which covered the glass floor, the subject's movements during each trial. Forty college students learned the standard pattern; 20 others learned the same pattern but with the odd-numbered alleys lengthened by 1.5 inches; 20 others learned the same pattern but with the even-numbered alleys thus lengthened. All subjects relearned after 7 days.

Complete entrances into the alleys entered at all predominate throughout practice. Some partial entrances occur throughout and the number increases from the first to the fourth quarter of the total trials, but there is no clear tendency for the depth of these partial entrances to decrease as practice proceeds. In the last quarter of the trials with alleys of equal length, only about one-fourth of the entrances are incomplete. The mazes with alternate alleys lengthened yield a greater increase of incomplete entrances, but in the final quarter of the trials not more than half of the entrances are incomplete. Complete entrances predominate on the last trial at which each cul is entered, on the first relearning trial, and on the last entrance during relearning.

There is, thus, no evidence of any uniform shift from complete toward partial entrance as practice goes on, and there is no evidence of a decreasing depth of partial entrance. A majority of the alleys are entered completely or not at all. The significance of these facts for theories of fixation and elimination will be discussed. [15 min.]

A Comparative Analysis of Curves of Satiation, Experimental Extinction, and Spontaneous Recovery. ANTHONY J. MITRANO, Yale University and Vineland Training School.

The purpose of these studies was to determine:

1. The relationship between the curve of satiation and the curve of experimental extinction of a primary habit.
2. The relationship between the curve of satiation of a primary habit and the curve of satiation of a secondary habit.
3. The nature of the curve and the amount of spontaneous recovery of experimental extinction of a primary habit after a period of five minutes.

Two mechanisms were employed. One machine yielded poker chips upon the insertion of marbles; the other machine yielded chocolate candy upon the insertion of poker chips. The first machine was used to measure the strength of the secondary habit and the second machine to measure the strength of the primary habit. The subjects

were forty mentally deficient children with mental ages from two to three years, and with chronological ages from six to twelve years.

The results, expressed by means of Vincent curves, may be summarized as follows:

1. Both the curve of satiation and the curve of experimental extinction of a primary habit are represented by the equation $y = -\tan 45^\circ x + b$. However, the curve of extinction shows sharp upward deviations which may be attributed to the factor of frustration, present during extinction but absent during satiation.

2. Irregularity and the absence of a gradient characterize the curve of satiation of a secondary habit and differentiate it from the curve of satiation of a primary habit.

3. The curve of spontaneous recovery of a primary habit differs from the original curve in lacking "steepness." After a period of five minutes, there is a spontaneous recovery of 8%. [15 min., slides.]

The Effect of Rest Periods Varying in Length upon Complex Motor Learning. ROLAND C. TRAVIS, Western Reserve University.

Problem: The experimental determination of the effect of rest periods of different lengths on the acquisition of complex motor skills.

Procedure: A pursuit-oscillator of special design, involving particularly eye-manual coördination with the subject in the standing position, was employed in this study. A small platform (15 cm. x 20 cm.) carrying a silver target (11 mm. in diameter), was oscillated through an arc of 13 degrees by a crank and pulley. A synchronous motor oscillated the platform at the rate of one complete oscillation per second. The task of the subject was to stand before the oscillating platform, which was about waist high and to hold a flexible stylus on the oscillating target. A continuous record of the subject's performance and time line in tenths of a second were made on the smoked paper of a spiral kymograph. Because of the difficulty of the task and the necessity for sustained attention, the learning periods were restricted to five minutes in length. The rest periods were 20 minutes, 48 hours and 120 hours between trials for 10 college men.

Results: (1) Fairly typical learning curves were obtained.

(2) For the first few trials of practice the score for the first minute of each successive trial was notably higher than the last minute of the previous trial.

(3) The rest period of 20 minutes was more effective than the 48-hour rest period, and the rest period of 48 hours was more effective than the 120-hour rest period in the acquisition of this complex motor skill.

(4) These results suggest: (a) That the rest period is more important than the last half of the learning period, and (b) that short rest periods (within 20 minutes) are more effective than long rest periods (48 hours). [15 min., slides.]

Further Study of Early Childhood Memory. HAROLD E. BURTT,
Ohio State University.

The present study is a continuation of one reported earlier in which nonsense material was presented to the subject in infancy and relearned when aged 8. The control consisted of similar material learned *de novo*. The material was Greek tragedy in iambic hexameter. Three selections of standard length were read to the subject daily between the ages of 15 and 18 months. Three more were read from the age of 18 to 21 months, etc. until the age of 3 years. Only one selection from each age level was employed in the eight-year experiment. In the present experiment an additional selection from each age level was relearned in identical fashion by a modified prompting method and compared with three entirely new selections which had not been presented in infancy.

In the eight-year experiment a saving of 40% was found, that is, the repetitions necessary for correct recitation of the passages that had been presented in infancy were 40% less than the repetitions necessary for the new passages. In the present experiment the corresponding saving is only 8% and the critical ratio indicates that there are 8 chances out of 10 that the difference is real. The learning curves for the two sets of material in the present experiment, however, are discrete and for the first half of the curves the differences between the ordinates are statistically significant. Evidence of retention is still present but there is a pronounced loss between 8 and 14 years. [15 min.]

The One-Error Per Trial Method of Maze Learning. THURMAN SCOTT, Ohio University.

Six groups (374 Ss.) learned 10, 18, or 21 alley U-type finger mazes. In the experimental groups, the Ss. stopped as soon as they made an error and started again at the entrance. In the control groups, the Ss. went through the maze each trial.

Two groups learning the 10 alley maze were given the usual maze instructions, and four groups learning the other mazes were given additional instructions, *i.e.*, description of unit structure of mazes and best method for learning mazes. With the 18 and 21 alley mazes, the one-error method was unquestionably superior in errors and apparently superior in time. With the 10 alley maze, the one-error method seemed inferior. This inferiority was not completely reliable statistically.

Reasons are given for these differences. [10 min.]

PROGRAM: ELECTROPHYSIOLOGY

THURSDAY, SEPTEMBER 3, 2:00 P.M.

104 McNUTT

WALTER R. MILES, *Chairman*

An Ontogenetic Study of Cerebral Action Potentials of the Guinea Pig. CHARLES S. BRIDGMAN, University of Rochester.

This work was done with the collaboration of H. H. Jasper and L. Carmichael.

This paper reports a study of the nature and development of rhythmic brain action potentials in adult and young guinea pigs. Fetal guinea pigs in which placental circulation was maintained and late fetuses in which air breathing had been initiated were also used.

Appropriate insulated silver electrodes were secured in the skull so that they made contact with the dura mater in the parietal region in each organism studied. The potentials led off by these electrodes were suitably amplified and recorded. In the case of the fetal organisms with placental circulation maintained, clamping off the umbilical blood vessels led to a dropping out of the brain rhythm in a few seconds after the clamp was applied.

What may be considered as characteristic potentials are found at least twelve days before normal birth time. There are also some indications of earlier brain potentials.

Rhythms ranging from 5 to 40 per second with predominating frequencies from 8 to 12 appear at all ages studied. The records of the youngest fetuses, however, show only isolated periods of activity, with long periods of quiet. Quantitative results of the study are given. A comparison of brain action potentials as an index

of functional maturity, with other indices of maturation, is also presented.

This work was done in the Psychological Laboratory of Brown University and at the Emma Pendleton Bradley Home. [15 min., slides.]

Brain Potentials from the Rat. LEE EDWARD TRAVIS, Psychopathic Hospital, Iowa City, Iowa.

With the same placement of electrodes, we have secured three types of rhythmic electrical potentials from the brain of the unanesthetized rat. Because of their characteristic appearance, these potentials have been named as follows: (a) Random. These are irregular waves associated with conditions of alertness of the animal. They present a variable frequency of about 40 per sec., and an intensity around 40 microvolts; (b) Bursts. These are regular waves associated with conditions of relaxation of the animal. They present a relatively consistent frequency of 7 per sec., and an intensity around 350 microvolts; (c) Extended. These are regular waves associated with the bursts. They present a relatively consistent frequency around 3 to 4 per sec., and an intensity around 175 microvolts. The random waves occur the most, and the extended, the least frequently.

Under ether anesthesia, the rat gave consistently regular waves of 2 to 3 per sec. in frequency and 100 microvolts in intensity.

Neither movement, nor any kind of stimulation we used had any appreciable effect on the random waves. A strong light, a strong, pure tone, and a loud shout were relatively ineffectual in obliterating the bursts. Movement and an imitation of a rat's squeal were relatively effective in depressing the waves in the bursts. The mean latency was 0.20 sec. and the range, 0.08 to 0.48 sec. These mean and range values for the latencies do not differ much from those reported on human subjects.

Acknowledgment is made to R. L. Milisen for assistance in this work. [15 min., slides.]

Variations in Blocking Time of Occipital Alpha Potentials in Man as Affected by the Intensity and Duration of Light Stimulation.

HERBERT H. JASPER and RUTH M. CRUIKSHANK, Brown University and Bradley Home.

An analysis of the nature of the blocking of the occipital alpha rhythm, as recorded from the surface of the head in man, has been

attempted by determining the variations in blocking time (the time between the incidence of light on the eye and the dropping out of the alpha potentials) with variations in the intensity and duration of a single light flash. Diffuse illumination of the entire eye with no point fixation was used to eliminate areal variations. Intensity was varied 7 log units above threshold and the duration of exposure was varied between 5 and 500 milliseconds.

With duration constant, blocking time varies inversely with the log intensity of the light according to a sigmoid curve, *e.g.* in one case, with a constant duration of 100 ms., the blocking time decreased from 920 ms. to 120 ms. with an increase in intensity to 7 log units above threshold.

With intensity constant, the blocking time is quite constant under optimal conditions for durations of exposure above 200 to 500 ms. (depending upon the intensity level). The blocking time is increased with a decrease in exposure time below this value, *e.g.* in one case an increase in blocking time from 106 ms. to 190 ms. was observed with variations in exposure time from 500 to 5 ms. We have not observed a blocking time under any conditions shorter than 100 ms., the period of the alpha rhythm.

The frequency of the alpha rhythm as it reappears following its blocking by light stimulation is higher than during the pre-stimulation period. This increase in frequency is greater with the higher light intensities. [15 min., slides.]

The Adaptation and Variability of Response of the Human Brain.

B. K. BAGCHI, The State University of Iowa.

Brain potentials from five human subjects have been recorded by means of low frequency amplifiers and an oscillograph, and the response (depression) and adaptation time following continuous and intermittent sound stimuli calculated in terms of the amplitude of the potentials. The adaptation time was defined as the time within which the waves regained more than 52% of the average pre-stimulus value counted over a second, after a measurable depression caused by these stimuli.

The brain adapted itself much quicker (maximum .96 sec.) to a continuous tone of 500 cycle than to the same tone repeated about every second (minimum 2 sec., maximum 8 sec.). An indifferent word like "HOW" repeated every second is more effective in depressing the waves and prolonging adaptation time than a similar indifferent word presented every other second. As a rule that is

also true of discrete words. Same discrete words presented for the second time reduced adaptation time. Some words seemed to have an associative value. In 46% of first stimulus presentations there were no noticeable depressions and there were considerable individual differences. A facilitation of amplitude from 102% to 348% of the pre-stimulus value was noticed in about 36% of adaptation events.

Adaptation to a continuous light source occurred within four minutes.

The view was discussed that any claim on attention was an important factor not only in depressing the waves but in determining the length of adaptation time. Although the psychological experience of "getting used to" a stimulus and neuro-physiological expression of adaptation were not correlated, evidence was given of the ability of the brain to reestablish the potency of its dynamic functioning in the face of continuous or repetitive stimulus attack. [15 min., slides.]

PROGRAM: PERSONALITY

THURSDAY, SEPTEMBER 3, 2:00 P.M.

105 DARTMOUTH

L. L. THURSTONE, *Chairman*

Relationship of Scores and Errors on the Army Alpha Test. C. R. ATWELL, Boston Psychopathic Hospital.

Alpha scores compared with number of errors on the alpha yield a straight line relationship. Deviations from this relationship should serve as indices of personality differences. The "caution factor" may account for some of the deviations. The person who obtains a given alpha score and makes many errors may differ in important respects from the person with the same score and few errors. This differentiation should be useful in the fields of education, and vocational guidance.

Tables will be shown giving norms of errors for alpha scores to be used as a basis for determining and evaluating these differences. [10 min., slides.]

Three Applications of Cluster Analysis to an Annoyance Study.
CHARLES M. HARSH, University of California, Berkeley.

In an inventory investigation of annoyances three somewhat distinct problems seemed amenable to mathematical methods of cluster analysis (or factor analysis). Responses to individual items were intercorrelated, and an analysis of the matrix of inter-item correlations revealed clusters of items the responses to which seem related. Such clusters of items suggest an empirical means of classification. When the annoyances were subjectively categorized by type of situation an analysis of the inter-category correlation matrix was a means of apprehending clusters of empirically interrelated types of annoying situation. The gratuitous interpretation of underlying factors is unessential to the method. Finally, following W. Stephenson's suggestion, the matrix of correlations between person's annoyance scores was analyzed as a means of apprehending groups of persons showing similar patterns of annoyance. Postulated annoyance "types" may be verified by such a procedure. [10 min.]

A Technique for Pattern Analysis. JOSEPH ZUBIN, U. S. Public Health Service.

In contrast with factorial analysis leading to the subdivision of many measures into a few underlying components, pattern analysis leads to a fractionating of the total group into several types, characterized by specific patterns or syndromes. The difficulties of pattern analysis are the large number of possible patterns that must be investigated and the lack of appropriate measures of reliability. The punched-card method has been adapted for the investigation of patterns by punching a card for each item instead of for each individual. A graphic solution of the equation for chi square provides a method for determining reliability without any computation. This technique was developed at the New York State Psychiatric Institute and Hospital for the analysis of personality inventory items. The frequency of each pattern is counted automatically by a machine developed by Dr. T. W. Forbes. [10 min., slides.]

The Discovery of Consistency-Content as a Method of Studying Personality. FLOYD H. ALLPORT, Syracuse University.

The problem of personality is fundamentally one of revealing intra-individual consistency. One form of this consistency is shown

by concentration of measurements of a representative sample of an individual's acts along a trait continuum whose range and scale intervals have been established with reference to a given population. The trait approach however is inadequate, for behavior which exhibits traits is not only measurable, but is individualized, dynamic, and peculiar to the individual concerned. The same acts which express the degree of a trait, as represented upon a societal trait-continuum, may also be rearranged upon a purely intra-individual, "telic" continuum according to the degree in which they fulfill something which the individual himself is trying to do. The thesis is advanced that the "characteristic" factor in personality is the concurrence of a number of teleonomically described activities which the individual is simultaneously endeavoring to carry out. In everything the individual does he is trying to do not *one* thing, but *a number of things*. Each act or trait thus seems to be invested with the character of the entire individual. This non-measurable configurational integration is incapable of statistical inter-individual comparison; yet it can be statistically studied as to the extent to which it is characteristic of the individual. It is apprehended by the individual's associates in a manner similar to perception. Though it cannot be formulated, it nevertheless gives us a predictively serviceable "law" for the individual concerned. A distinction is thus made between the method of trying to discover the amount of consistency for particular types of content and the search for a content (perceptual or recognition "set") which reveals the highest degree of consistency. Experiments illustrating the latter are described.

[15 min.]

A Test of Five Personality Traits of Adolescents and a Statistical Theory of Personality. HENRY C. LINK, The Psychological Corporation.

On the basis of clinical experience and available tests, a new test of personality traits for children, age ten to eighteen, was constructed. Five traits are included, namely:

- Adjustment to the opposite sex
- Social ascendancy or submissiveness
- Self-determination
- Economic self-determination
- Extroversion-introversion

In 1934, the test was given to five hundred Junior High and High School pupils, and subsequently a careful item analysis and series

of inter-correlations developed. The test was then revised and in 1935, given to 1,500 children. The results were again subjected to rigorous statistical treatment, with advice from Lorge & Dunlap.

The results will be presented, and also a theory of personality growing out of the controversial points raised by this and collateral investigations. The question of 'traits by fiat' and 'independent' traits, and of validity, will be considered. [15 min.]

Personality Traits of Negro College Students. MAX MEENES,
Howard University.

With the aid of Mr. James A. Bayton, a graduate student, the Bernreuter Personality Inventory was given to 200 Negro college students. The results show that they have less neuroticism and social feeling, and more dominance, extroversion, feeling of superiority, and self-sufficiency than white college students. The only sex difference was in self-sufficiency. Negro college students from the urban areas tend to be more stable, dominant, extroverted, superior, self-sufficient and social-minded than those from small cities and rural districts. Negro college students from the south are more sociable, less neurotic, and less introverted than those from the north. The youngest child is less neurotic, more extroverted, dominant, ascendant, superior and self-sufficient than the only, intermediate, or oldest child. The only child is the more sociable. [10 min.]

PROGRAM: CUTANEOUS PHENOMENA

THURSDAY, SEPTEMBER 3, 2:30 P.M.

13 CARPENTER

E. S. ROBINSON, *Chairman*

Normal Variation in Auditory and Vibro-Tactile Sensitivity. LOUIS D. GOODFELLOW, Northwestern University.

Auditory and vibro-tactile thresholds for frequencies of 64, 128, 256, 512, 1,024, 2,048, 4,096, and 8,192 double vibrations per second were determined daily for a period of three weeks in order to study the normal fluctuation of threshold values. During the second week, thresholds were determined four times daily—early

morning, noon, late afternoon and evening. Although certain individual observers showed greater sensitivity at a particular time during the day, the group as a whole exhibited no consistent tendency which would suggest an optimal time of day. Considerable variation both from day to day and during the same day was found in both auditory and vibro-tactile fields. [10 min., slides.]

Is Vibratory Sensitivity Mediated by the "Pressure Sense"?
FRANK A. GELDARD, University of Virginia.

Evidence leading to a resolution of the von Frey-Katz controversy concerning the nature of vibratory sensitivity may be derived from careful exploration with a vibrating needle of skin areas in which the status of pressure sensitivity is known. An experiment employing a carefully controlled vibratory stimulus (Geldard and Gilmer, 1934) is reported. Preliminary examination of the skin test area with a pressure stimulus (the skin gradient being kept constant throughout) revealed "points" lying at the extremes of the pressure sensitivity distribution. Those areas showing consistently high and consistently low sensitivities were selected for test. The degree of correspondence between pressure and vibratory responses, the latter being measured over the entire range of frequencies yielding vibratory feelings, is reported. Some of the consequences for tactual theory are discussed. [10 min., slides.]

Improvement in Tactual Localization without Localizing Movements.
NORMAN L. MUNN, George Peabody College for Teachers.

This investigation was to determine whether improvement in tactual localization occurs when the subject makes no localizing movements and when knowledge of results is denied. The subjects were given daily trials in localizing thirty points on the forearm. The situation was arranged so that, if learning occurred, it would have to result from an improved knowledge of the spatial characteristics of the stimulated area rather than from improvement in localizing movements as such, a possibility present in the usual tactual-kinesthetic method of localizing. Learning was clearly evident. The trend was similar to that found for tactual-kinesthetic localization. The subjects were able to recognize the relative positions of the points stimulated, and this formed the basis of learning.

Theories of cutaneous localization are considered in the light of these results. [10 min., slides.]

The Development of Temperature Sensitivity During the Fetal Period. LEONARD CARMICHAEL, University of Rochester.

The work reported in this paper has been done jointly with Mr. G. F. J. Lehner in the Psychological Laboratory of Brown University.

Only the most casual and fragmentary reports of temperature sensitivity in the fetal period are available. This paper reports a study of this sense during that period of development.

In the present series of experiments guinea pig fetuses of known insemination age have been prepared for study, using techniques previously described by the writer, which maintain placental blood supply and other conditions in an approximately normal state. The skin areas of each fetus stimulated were: (1) vibrissae area; (2) concha; (3) shoulder; (4) rump; (5) fore paw, and (6) hind paw. In each case these spots were first stimulated by controlled drops of physiological saline of the temperature of the bath (37.5° C.) as a control for tactual stimulation. Following this, each spot was stimulated by controlled drops of saline of 5° , 17° , 27° , 47° , 67° and 85° C.

In all, 31 fetuses have been systematically studied, grouped in the early, middle, and late fetal periods. Slides presenting detailed data are given. Among others, the following conclusions are presented:

(1) Sensitivity to temperature, as judged by response, increases throughout the fetal period, as determined both by absolute number of responses made to temperature stimuli and by an increase in number of responses made to temperatures near the physiological zero of the organism.

(2) Responses released by temperature stimulation are more "specific" or reflex-like in the early period than in later periods.

(3) Some indication of the cephalo-caudal course of development of temperature sensitivity is apparent. [15 min., slides.]

PROGRAM: PSYCHOMETRICS

SPONSORED BY THE PSYCHOMETRIC SOCIETY

FRIDAY, SEPTEMBER 5, 9:00 A.M.

105 DARTMOUTH

H. WOODROW, *Chairman*

Rank-Difference and Unlike-Sign Correlations as Approximations to the Pearson Product-Moment Formula. EDWARD E. CURETON, Alabama Polytechnic Institute.

"Student" has noted that Spearman's rank-difference formula assumes complete ranking in each variate, and has derived corrections for tied ranks. An empirical check using test scores shows that these corrections seldom change ρ as much as .02. From the same empirical data it appears that the average difference between product-moment correlations and either rank-difference correlations or unlike-sign correlations is small. The differences between product-moment and unlike-sign correlations are appreciably more variable than are those between product-moment and rank-difference correlations. The ratio of the standard deviations of these sets of differences is about equal to the ratio of the standard error of the unlike-sign correlation to that of the rank-difference correlation. This ratio, numerically, is of the order of .5. [10 min.]

New Economical Formulas for Multiple Regression. HAROLD D. GRIFFIN, Nebraska State Teachers College.

The partial correlation technique for obtaining multiple regression equations continues to be used by many psychometricians instead of the more economical solution by resolving simultaneous linear equations, simply because it is easier to follow the systematic steps in a series of formulas than to keep in mind the procedure followed in determinantal solution, iteration, or the Doolittle method.

Several statistical workers have simplified solution by determinants through reduction of the steps to a semi-formulary. The Doolittle method, however, is far more economical than determinants, especially when there are many variates. The speaker has reduced the Doolittle method to a series of progressive formulas

which enable the psychometrician to obtain the multiple regression equations with marked economy of time and effort. Moreover, with but slight additions these new formulas may be used in obtaining partial correlation coefficients and other statistical concepts. [10 min.]

Independent Factor Scores from Correlated Test Scores. PAUL HORST, Procter and Gamble.

This paper considers the problem of obtaining a matrix of independent factor scores in less than n variables if we have given a matrix of n sets of correlated scores.

We begin with a matrix of observed measures in n variables which are not in general statistically independent. This matrix is not in general of rank less than n . We regard this matrix as the sum of two matrices, one of which is a matrix of "true" measures and the other a matrix of chance errors.

The matrix of "true" measures is defined as one which satisfies the following conditions:

1. It is of rank less than n .
2. It is independent of the error matrix.
3. The sum of the squares of the elements in the error matrix shall be a minimum for a specified rank of the matrix of the "true" measures.

We then consider the transformation of the matrix of "true" measures into another matrix which will satisfy the following conditions:

1. The number of column vectors which it contains shall be equal to the rank of the matrix of "true" measures.
2. The column vectors shall be mutually orthogonal.

The derivation of formulas necessary for the determination of these matrices is presented. Certain mathematical conditions which must be satisfied are outlined.

The relationship of the concepts of communality and reliability to the determination of the final matrix of independent measures is discussed.

Certain conditions under which independence of the factor scores is maintained or modified are discussed. [15 min.]

On the Inadequacy of the Reliability Coefficient When Used with I.Q. Data. QUINN McNEMAR, Stanford University.

The evidence in the literature to the effect that higher I.Q.'s are relatively less constant than lower I.Q.'s on the Stanford Binet

test has been interpreted as indicating faulty standardization and insufficient top. It is here shown that this greater fluctuation of higher I.Q.'s is inherent in a mental age scale. Assuming adequate standardization and that each age group from 3-18 yields the same "reliability coefficient" and spread of I.Q.'s, it is proved that the standard error of an I.Q. of 130 should be about twice the size of the error for an I.Q. of 70. As an empirical test of the logical analysis, predicted average differences in I.Q.'s were found to check with actual average differences between I.Q.'s obtained on Forms L and M of the New Stanford Revision. [15 min.]

A Formula for Determining the Best Single Set of Weights to Use in Simultaneously Predicting Several Criteria. ALBERT K. KURTZ, Procter & Gamble Company.

Often several imperfectly correlated criteria (such as ratings of various aspects of mechanical ability) are available against which two or more tests or other independent variables may be validated.

By logarithmic differentiation and algebraic manipulation, a method is derived for utilizing each of the criteria (instead of arbitrarily selecting one) and for simultaneously predicting each criterion with a single set of weights. The weights thus obtained will give the highest possible average correlation between the various criteria and the weighted composite of independent variables.

Formulae are obtained both for the weights assigned to the independent variables and for this average correlation. The formulae are given for two situations: (a) in which the several criteria are equally weighted, and (b) in which any other predetermined set of weights is assigned to the criteria. [10 min.]

The Isolation of Seven Primary Abilities. L. L. THURSTONE, The University of Chicago.

A battery of fifty-six psychological tests involving fifteen hours of testing time was given to a group of 240 student volunteers at the University of Chicago. The tests were assembled specially for this study and they involved a variety of verbal, numerical, and visual material. A factor analysis has revealed seven abilities which satisfy quite satisfactorily the requirements of a simple structure. The analysis was made to nine dimensions but only seven of the primary axes lend themselves clearly to psychological identification. These primary abilities have been named visual imagery, perceptual speed, memory, word fluency, number facility, induction, and verbal

relations. These primary abilities are uncorrelated. Scoring methods have been prepared for the appraisal of each individual subject on each of these seven primary abilities. [15 min., slides.]

The Relationship Between the Multiple Correlation and the Communality. HAROLD GULLIKSEN, University of Chicago.

It will be shown that the square of the multiple correlation coefficient of a test with the rest of the tests in a battery approaches the communality of that test, as the number of tests in the battery increases without limit, while the rank of the system remains constant. Roff has proved this theorem for a special case of rank one and suggested that it also holds for the general case of rank r .

It can be shown that

$$\frac{\Delta}{\Delta_{oo}} = \frac{u^2_o \Delta_{oo} + H}{\Delta_{oo}} \quad (1)$$

in which Δ equals the correlational matrix with unity in the diagonals, u^2 is the uniqueness of test o and

$$H = \begin{vmatrix} h & r & r & \dots & r \\ r & 1 & r & \dots & r \\ r & r & 1 & \dots & r \\ \dots & \dots & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots & \dots \\ r & r & r & \dots & 1 \end{vmatrix}$$

By expressing each of the determinants Δ_{oo} and H as the sum of 2^n determinants, it can be shown that $\frac{\Delta}{\Delta_{oo}}$ approaches zero as the

order of the two matrices increases without limit, while the rank remains constant.

Therefore

$$\frac{\Delta}{\Delta_{oo}} = u^2_o \quad (2)$$

when n increases without limit.

Substituting formula (2) in the determinantal formula for multiple r gives

$$R^2_{o..12\dots n} = 1 - u^2_o \quad (3)$$

from which it can be seen that the theorem stated above holds for the general case of rank r . [15 min.]

PROGRAM: CONDITIONED RESPONSES

FRIDAY, SEPTEMBER 4, 9:00 A.M.

104 McNUTT

L. CARMICHAEL, *Chairman*

Comparison of the Conditioned and Unconditioned Responses Based on Fore Leg Shock in the Rat. HAROLD SCHLOSBERG, Brown University.

There has been a growing interest in the similarities and differences between the conditioned response and the unconditioned reflex upon which it is based. Quantitative differences in latency and form are necessary results of the different neural pathways involved. Qualitative differences have also been observed.

In experiments involving ninety rats, as conditioning progresses, the following responses are obtained: shift in breathing rhythm, sharp inspiration, squeal, tail reactions, and finally leg flexion. Each element may be elicited by a shock of appropriate strength. Therefore, one may describe the differences between the unconditioned and conditioned responses as quantitative, rather than qualitative. From another viewpoint the preparatory nature of the conditioned response may be stressed. Whether we find similarities or differences between conditioned and unconditioned responses will depend upon our definition of "response." [10 min., slides.]

Relation of the Conditional Salivary Response to Concomitant Overt Behavior. KARL ZENER, Duke University.

The relation of the conditional salivary response to typical simple reflexes on the one hand and to more complex behavior on the other is of significance both for physiological interpretation of the phenomenon and for general learning theory. The present paper reports a series of experiments directed toward an analysis of the relation of the secretory activity to other features of the response produced by the conditioned stimulus.

The method involves observation, in large part simultaneous, of salivary secretion and overt behavior under varied experimental conditions. Specifically these include: the conditions of regular training, of increased and decreased hunger, of differential satiation

on specific foods, of different external situations, and of experimental extinction.

With changes in the experimental situation there occur correlated changes in the secretory and overt components of behavior. The detailed nature of this relationship is of psychological significance, indicating that the conditioned salivary component is to be regarded as part of a wider, organized, and biologically adaptive response. It is this larger response which appears to be directly involved in learning. Of significance in this connection is the fact that hunger influences the magnitudes of the conditional and unconditional salivary response to food in a quite different manner.

Specific implications of the results for a psychological and neural theory of the conditional response are formulated. [15 min., slides.]

Successive Extinctions After Two Degrees of Reinforcement in the Rat. RICHARD E. P. YOUTZ, Yale University.

The conditioned-response approach to learning rests in part upon the assumption that with greater numbers of reinforcements the conditioned response is stronger. Many investigators have demonstrated this in experimental situations where the conditioned and unconditioned stimuli were presented at intervals determined by the experimenter. In the present investigation the subject was relatively unconfined and was free to respond at any time.

The rats were placed in a sound-shielded experimental box, similar to that used by Skinner. A short horizontal bar was hung near and parallel to one wall. Depression of this bar by the rat's paw delivered a pellet of food into a food tray. This constituted one reinforcement. During extinction no pellet followed the response to the bar. Two groups, of nine rats each, received reinforcement and extinction on the bar-depressing response. One group received 10 reinforcements, the other group 40. Both groups underwent extinction (1) immediately upon completion of the reinforcements, (2) 24 hours later, and (3) 55 days later. All responses during reinforcement and extinction were recorded stylographically.

At immediate extinction the mean values for the 40-reinforcement group were greater than those for the 10-reinforcement group by all measures used; *viz.*, number of extinction responses, time necessary for extinction, and rate of responding during extinction. Only the values for number of extinction responses were reliably different, although other measures approached reliability. At the 24-hour extinction mean values for the number of extinction

responses for the two groups were again reliably different, with mean times for extinction less reliable, and rates of response approximately equal. At 55 days no differences were reliable. Implications for the trial-and-error learning situation are discussed. [15 min., slides.]

The Extinction Ratio and Its Modification by a Temporal Discrimination. B. F. SKINNER, University of Minnesota.

It has previously been shown that the number of unreinforced occurrences of a conditioned response is directly related to the number of reinforcements and that under a constant rate of periodic reinforcement a constant rate of responding is observed. The ratio of the number of responses unreinforced to the number reinforced is the extinction ratio. This relation cannot hold when the reinforcement is made conditional upon the completion of a given number of responses, *i.e.*, when there is an experimentally fixed ratio in place of an extinction ratio adopted by the organism. Two cases are possible: when the fixed ratio is less than the extinction ratio, there is an increase in the store of unelicited responses and the rate increases; when the fixed ratio is greater than the extinction ratio, there is a decrease and the rate falls. In the latter case the organism may, however, develop a temporal discrimination by virtue of which the extinction ratio is increased from about 20:1 to as much as 200:1. The rate of responding between successive reinforcements shows a smooth acceleration which corresponds to a 'temporal gradient.' The gradient is produced with great uniformity. Extinction curves following the development of the temporal discrimination show characteristic properties, including an initial limb of extraordinarily intense activity. [15 min., slides.]

The Extinction of Startle Responses and Spinal Reflexes in the Rat.

WALTER S. HUNTER, Brown University, and C. LADD PROSSER, Clark University.

The intact rat's startle leg-response to a near threshold auditory stimulus weakens and finally disappears if the stimulus is repeated at intervals of 10-15 seconds. The course of this extinction was followed observationally, kymographically, and electrically in terms of muscle potentials detected with concentric needle electrodes. The latter data indicate that extinction consists in a diminution in the number of active motor units, a decrease in the duration of the after-discharge, but no change in the latency of the several units. The

extinguished response can be disinhibited by general stimulation. A tail-response to tap on the tail and a crossed leg-response to direct stimulation of the saphenous nerve were also extinguished and disinhibited in spinal rats. As with the startle response in the intact animal, there was no change in the latencies of the individual motor units; but during extinction there was a decrease both in the number of active units and in the duration of the after-discharge. Sensory adaptation and fatigue seem to be excluded as explanatory factors. Extinction, shown here apparently for the first time in spinal reflexes, is interpreted as a slow, semi-permanent shift in excitability of the central part of the reflex arc lying between the sensory and final motoneurones. [15 min., slides.]

A Comparison of the Development of Delayed and Trace Conditioned Responses. ELIOT H. RODNICK, Yale University.

This investigation provides a partial test of the widely held assumption that the properties of delayed conditioned responses are identical with those of trace conditioned responses.

A delayed conditioned response was established in one group of subjects by the use of a 20-second interval between the onset of the persisting stimulus and the reinforcement by shock. The mean latency of the conditioned galvanic skin response increased from 4.8 seconds to 10.1 seconds after 47 reinforced stimulations. A trace conditioned response was set up in another group of subjects by the employment of a 17-second interval between the onset of a brief conditioned stimulus and the shock. It was found that with continued reinforcement the latency of the trace conditioned response increased at about one-ninth the rate of the delayed conditioned response.

The mean latency of the last 25 per cent of the trace conditioned reactions for each session showed a progressive increase during the 20 days of the experiment, whereas the mean latency of the first 25 per cent of each day's reactions showed only a very slight increase. This indicates that the latent period of the trace conditioned response tends to decrease to almost its original value after a 24-hour rest period. A 15-minute rest period, introduced at one point in the procedure, caused a reduction of 50 per cent of the increase in the latency of the delayed conditioned response resulting from the previous training.

It was observed that the conditioned galvanic skin response in both experiments frequently consisted of a dual wave. The secondary response nearer to the point of reinforcement showed an

increase both in latency and in frequency with continued training.
[15 min., slides.]

A Study of the Relation Between Experimental Environment and the Conditioned Reflex in the Pig. H. S. LIDDELL, Cornell University.

The pig's resistance to restraint is violent and varied, including responses suggesting temper tantrum and flight from reality in man. When its freedom was gradually restricted over a period of several months the pig finally stood quietly in harness with electrode attached to the foreleg. It was taught to secure apple by opening a box. Standing in harness the pig could lift the lid of the box and secure apple at a signal. When strong electric shocks were first applied to the animal's foreleg it flexed the limb but at the same time opened the food box. The environment had become a feeding environment from the pig's point of view and it refused, after more than 200 tests, to lift its leg in anticipation of the noxious stimulus. Alternate feeding and shocking days modified the pig's view of its environment until a defensive reaction appeared at the signal of approaching shock on the appropriate day. The pig now resisted the experimenter's attempt to fasten the electrode bracelet to the leg and squealed at the application of the electric shock. On feeding days its deportment was quiet and its reaction to the signal for food, prompt and precise. A continuous tone of 600 cycles in the experimental room indicated feeding day and its cessation for ten seconds was the signal for apple. A tone of 750 cycles indicated shocking day in the familiar environment and its cessation was the special signal for shock. The change of tone from 600 to 750 cycles in the middle of the experimental period produced agitation with struggling in the harness.
[15 min.]

PROGRAM: EMOTION AND MOTIVATION

FRIDAY, SEPTEMBER 4, 9:30 A.M.

14 SILSBY

H. E. BURTT, *Chairman**Emotional Idiosyncrasy as Discriminated by Various Methods.*

HAROLD E. JONES, University of California.

In an adolescent group of 100 cases, observed and tested over a four-year period, the following records were cumulated: Galvanic skin reactions, blood pressure and pulse records; respiration records, and body movements during periods of emotional excitation; association tests; self-report emotional inventories; behavior trait ballots by classmates; systematic observations and ratings by staff members, parents and teachers.

On the basis of a consensus of judgment of clinicians and counselors, 20 cases were selected at each extreme on a scale of emotional idiosyncrasy. The various measures, and various combinations of measures, are considered with reference to their discrimination of behavior extremes at successive ages, and implications are drawn with regard to the comparative significance of these measures. [10 min.]

Guilt Distinguished from Complicity. WALTER G. SUMMERS,
Fordham University.

The validity of psycho-galvanometric techniques for the detection of crime has been questioned by reason of interference from extraneous emotional influences. A new instrument which eliminates many sources of error in previous techniques was employed for the discrimination of personal guilt by the perpetrator of a given act from the knowledge of the guilt of this person known by witnesses or accomplices of the act. The situations chosen for the test closely simulated actual life situations. The subjects were male and female, adolescent and adult. Various procedures were tried and one procedure selected which resulted in a valid method for the differentiation of personal guilt from observational knowledge of guilt and complicity. [10 min.]

Skin Response Potentials as Related to the "Exciting" Character of the Stimulus. T. W. FORBES, New York State Psychiatric Institute and Hospital.

In a previous paper it has been reported that by using a single reacting skin area and recording potentials it is possible to obtain a predictable skin response waveform. Evidence has been presented that there are two component responses which may be independent and one of which gives evidence of the sympathetic character usually associated with the "psychogalvanic response." It would therefore be expected that this component would occur with "excited response."

In order to investigate the relation between waveform and stimulus type shock, startle, and association word stimuli were used with four male and four female subjects. Although pure potentials were not recorded the *a* and *b* waves were observable, but distorted. In general, the *a* response occurred with normal or non-exciting stimuli and the *b* with "exciting" stimuli which included novelty, startle, apprehension and emotional association words (indicated by block, peculiar content or reported embarrassment).

It is suggested that a quantitative comparison of responses between individuals may be possible in terms of the normal *a* response. Such comparison has been desirable in many studies. Reliable indicators of non-excited and of sympathetic response should be valuable in psychopathology.

Miss Marjorie Bolles, Dr. A. L. Benton and Dr. James Page assisted greatly in taking the records. [15 min., slides.]

Quantitative Correlates of Feeling Tone. W. A. BOUSFIELD, Tufts College.

In the course of an investigation of factors determining feeling tone, 400 undergraduates furnished the following data: (1) an estimate of the present feeling tone on a plus five to minus five basis; (2) a list of all the pleasant and unpleasant items that each subject could enumerate, no limitation being placed on the nature of these items. Equal time intervals were allowed for the listings in the two categories.

The data indicate a definite correlation between the ratings of feeling tone and the ratios of pleasant items to unpleasant items. The results are interpreted as not only giving objective evidence for the validity of the self-ratings, but as also implying the generality of a mood which can well be designated as euphoria. [10 min.]

Changes in Problems and Interests with Increasing Age. PERCIVAL M. SYMONDS, Teachers College, Columbia University.

A survey of problems and interests in fifteen areas among high school students, college students, and graduate students of education has provided data which make it possible to study the changes in problems and interests from early adolescence through middle life.

The results indicate that in general the areas of life which rank high as problems and for interest by adolescents maintain roughly the same relative order with adults. There is progressively greater interest in philosophy of life, in mental health, in civic affairs, and less interest in courtesy and manners, recreation, and safety. Girls also find greater interest with increasing age in the daily schedule and less interest in personal attractiveness. The curve for sex both as a problem and an interest shows a maximum around the age of twenty-one.

The differences between the sexes for both problems and interests are greater in the period of late adolescence than at any other time of life. At the time when men and women are most fecund biologically they are most unlike each other in their interests. The data indicate that men are interested in items representative of the urge toward success and their personal establishment in society, while the greater passivity and receptivity of women which makes them more introspective and more reflective is indicated by their greater interest in personal philosophy, in planning the daily schedule and in their concern with problems of mental health. Men show a greater direct interest in sexual adjustments while women's interests along this line are probably best reflected by their higher ranking of personal attractiveness. [15 min.]

Ideational or Symbolic Motives. JAMES R. PATRICK and GAIGE B. PAULSEN, Ohio University.

It was our purpose to canvass the ideational or verbalized thought processes which students claim motivate them. In response to instructions, "Please write down your persistent recurring thought processes or ideas which come to you and have been coming to you over and over again and which you feel motivate you to do your school work, to form your friendships, and to engage in your social, recreational, and religious activities," some six hundred students over a period of four years and under different instructors have responded by writing down their ideas and thought processes under the above captions. Responses indicate that the kind and frequency

of these "mental" motives are sufficiently similar in different groups to be of interest and to warrant further study. The extent to which these motives are correlated with more objective measures of motivation will also be reported. [10 min.]

Effect of Success and Failure on Level of Aspiration. PAULINE K. SNEDDEN, New Haven, Conn.

On each of three days twenty-five subjects completed ten trials on each of four tasks: dart throwing, card sorting, code and a test of kinesthetic judgment. Subjects set a level of aspiration before each trial after having been told the score of the previous trial. (1) The average difference between level of aspiration and performance was positively correlated with rigidity of the level of aspiration. (2) The level of aspiration responded more readily to improvement in performance than to decrement. (3) Under artificially induced success this relationship became more pronounced and under induced failure disappeared. (4) The average difference between performance and level of aspiration was positively correlated with the effects of both success and failure on efficiency of learning series of nonsense syllables. [10 min.]

PROGRAM: AUDITORY PHENOMENA

FRIDAY, SEPTEMBER 4, 1:30 P.M.

13 CARPENTER

HAROLD E. JONES, *Chairman*

Curve of Response to Auditory Stimuli Preceding Sleep. MARION R. BARTLETT, New Haven, Conn.

In this study we investigated the type of curve of response to auditory stimuli of threshold values, during the process of the subject's going to sleep. Readings were made with an audiometer in terms of decibels, and as a criterion of sleep we used the subsequent report of the subject. The results show that there were no *typical* curves preceding sleep, but rather individual ones. All of the curves show considerable rise in the stimulus intensity eliciting a response during the course of the experiment. But there were marked individual differences in the amount of rise of stimulus intensity and in

the time during which these changes occurred. The data for this experiment were compiled at the New York Psychiatric Institute and Hospital. [10 min.]

The Psychophysiology of Loudness. S. S. STEVENS, Harvard University.

Experiments designed to determine the intensities of two tones, one of which sounds half as loud as the other, furnish data for the construction of a psychological or 'subjective' scale of loudness. This scale can be applied to the measurement of the 'subjective' magnitude of a difference limen (DL) for auditory intensity. The 'subjective' magnitude of all DL's is not constant, as Fechner assumed, but increases with the intensity of the stimulus. The empirical relationship between the 'subjective' magnitude of a DL and the number that the DL is above threshold was determined by plotting the summated DL's against the loudness scale.

In collaboration with H. Davis an effort was made to determine the physiological process which underlies the loudness function. Measurement of the electrical response recorded at the round windows of guinea pigs shows that the cochlear potential is, as a first approximation, the same function of the intensity of the stimulus as is the loudness function. Furthermore, these two functions coincide with the measured potential of the action currents in the auditory nerve. Consequently, the form of the loudness function appears to be imposed by the magnitude of the electrical potential generated in the cochlea, and is represented in the auditory nerve as the number of active fibers.

The number of additional fibers that must be activated in order to produce a DL must be assumed to be proportional to the 'subjective' magnitude of the DL. Calculations based on the number of fibers in the auditory nerve, the total number of DL's, and their relative size show that the first few DL's above threshold may each involve the addition of less than one active fiber. [15 min., slides.]

The Response of the Cochlea to Tones of Low Frequency. ERNEST GLEN WEVER and CHARLES W. BRAY, Princeton University.

In collaboration with Clarence F. Willey, an oscillographic study was made of the electrical responses which arise on stimulation of the ear of the guinea pig by sounds of low frequency. A pistonphone driven by a motor of variable speed gave sinusoidal waves with

frequencies from 5 to 60 cycles per second, and with intensities in steps of 5 decibels from 1 to 1,000 bars.

The relationship between magnitude of cochlear response and intensity of stimulation was determined for representative frequencies within the above range. This relationship was also investigated for nerve impulses which accompany the cochlear response. At each frequency studied, a threshold of intensity was found for the nervous response, but no true threshold was discovered, within the limitations of the apparatus, for the cochlear response.

The wave form of the response was found to vary with both frequency and intensity. Subjective harmonics were prominent, especially at high levels of intensity.

The results are discussed in relation to the problem of the lower limit of hearing, and also in regard to general theories of the operation of the ear. [15 min., slides.]

Electrical Responses of the Lateral Lemniscus to Monaural and Binaural Stimuli. E. H. KEMP, National Research Fellow, Harvard Medical School.

Dr. Georges Coppée and Miss Ellen Robinson have collaborated in these experiments.

Cats under avertin anaesthesia have both auditory bullae opened to permit the placement of wick electrodes on both round windows. Removal of part of the skull and tentorium on either side permits the placement of concentric needle electrodes in the lateral lemniscus. Simple loud-speaker clicks are used as stimuli. When stimulation is monaural we obtain a response to each click from either the homolateral or the contralateral lemniscus. With stimuli of low intensity the homolateral and contralateral responses are usually almost identical in latency, threshold, and amplitude (provided that the two ears of the cat have comparable round-window thresholds). As intensity is increased to about the 40-db-above-threshold level, an earlier wave appears in the homolateral response and not in the contralateral. Latency decreases with intensity until a minimal value is reached about 30 or 40 db above the threshold for each wave. Measurements of amplitude of response indicate that additional fibers are activated with increasing intensity of stimulation over a range of possibly 60 db or more of intensity variation, but it is not possible to show increasing amplitude of response over so wide a range with a single placement. Results of simultaneous stimulation with tones and clicks (masking) are consistent with expectations based on a "place" theory.

With binaural stimulation we have observed addition of effects from the two ears, which might be inferred from results with binaural stimulation in human subjects. Some evidence for convergence of pathways at the first or second synaptic region has also been obtained. [15 min., slides.]

Increased Auditory Acuity in Dogs Following Roentgen Radiation of the Pituitary Body. W. J. BROGDEN, University of Illinois.

The transient rise in auditory acuity following X-radiation upon the head of dogs whose hearing has been accurately measured by the conditioned-response technique, was found to be a true auditory effect and not due to increased motor-responsiveness. Since the increased auditory sensitivity is an all-or-none effect (the magnitude and duration of the gain being fairly constant, without regard to intensity of radiation), and since two normal animals radiated on areas other than the head showed no change in hearing, the pituitary gland appeared to be a likely locus of the auditory effect of Roentgen radiation. Inasmuch as two hypophysectomized dogs showed no change in auditory acuity when radiated upon the head under Roentgen conditions which produced the hearing rise in normal animals, it follows that the locus of the X-ray effect upon hearing is the pituitary body. As the hypophysectomized dogs increased in auditory acuity 40 to 45 days after operation without being X-rayed, and as it is well known that hypophysectomized animals are hyperinsulinic, it was postulated that X-radiation of the hypophysis produced a consistent low level of blood sugar which increased auditory acuity. Subsequent tests on a diabetic subject and upon a normal dog, revealed hearing to be increased with a low sugar level and to be impaired with a high sugar level. It is assumed that changes in the density of the blood due to changes of sugar content are transmitted to the cerebrospinal system, of which the cochlea is a part. Changes in density of the cochlear fluid modify the action of the basilar membrane in such a way that increased density (high sugar-level) reduces functional sensitivity and decreased density (low sugar-level) raises sensitivity. [15 min.]

A Study of the "Time Error" in the Judgment of Sound Intensities with Short Intervals of Separation of Two Stimuli. MORGAN UPTON, Harvard University.

This study is concerned with the phenomenon previously described under the term 'time error,' and was done in collaboration with Miss Ellen H. Robinson. The phenomenon appears when a

second intensity of stimulation is judged in terms of the intensity of a prior one. It is represented by a tendency to judge the second of two equally intense stimuli as greater or less or equal to the first depending on the temporal separation of the two.

Previous investigations have dealt with temporal separations of more than 1.5 seconds. The present experiment involved temporal separations ranging from .03 to 0.8 second. The method was an adaptation of the Method of Constant Stimuli. The point of subjective equality was taken as the voltage of the second tone which was constantly judged to be equal to the first.

The function relating the intensity difference of the two stimuli ($I_1 - I_2$) to the time of separation declines as the temporal separation increases. It is a cyclic function with two cusps; one appearing within the range of 0.35 to 0.45 second and the second in the range 0.75 to 0.8 second. These peculiar breaks which occur in the plotted curves may represent some kind of rhythmicity in the auditory system. Another possibility is that they represent the superimposition upon the residual effect of previous auditory stimulation of some other rhythmic process occurring within the central nervous system.

Since in the earlier series of observations both tones were delivered to both ears it could not be assumed that the data describe a process taking place in the central nervous system. A final series of observations were made in which the first tone was delivered to one ear and the second to the other ear. The data yielded a curve which was approximately identical in nature with the curves obtained when both ears were stimulated by both tones. This seems to clearly indicate the central nature of the phenomenon. [15 min.]

The Absolute Impression of Temporal Intervals. SARAH FERRALL ANDERSON, University of Illinois.

The indifference interval for empty and filled intervals was determined by the method of absolute impression. Twelve hundred and four college students served as subjects. Each subject was presented with a particular series of intervals, each series presented three times (chance, ascending, and descending order). All of the series showed indifference intervals after the series had been presented once, indicating that the subjects set up a standard within the range of intervals presented by which they judged the relative and not absolute impression of the length of the intervals. In order to determine the indifference interval unaffected by any particular range of

intervals presented, only the judgment made to the first interval presented to each subject was used. Under this latter condition the indifference interval for empty intervals was $2,480 \text{ sigma} \pm 90 \text{ sigma}$, and for filled intervals $1,303 \text{ sigma} \pm 43 \text{ sigma}$. [10 min.]

PROGRAM: ABNORMAL PSYCHOLOGY II

FRIDAY, SEPTEMBER 4, 2:00 P.M.

14 SILSBY

JOHN A. McGEOCH, *Chairman**The Rorschach Method of Personality Analysis in Organic Psychoses.* ZYGMUNT PIOTROWSKI, Columbia University.

In a preliminary investigation of organic psychotics by the Rorschach method a list of eight signs peculiar to organic psychotics was obtained. This list was then applied to a group of twenty patients with psychoses of possible organic origin. By means of these signs it was possible to suggest differential diagnoses which were not incompatible with results of neurological and psychiatric examinations in any of those cases.

The Rorschach technique was found to aid recognition of organic conditions as well as other laboratory methods with the exception of surgical investigation. The experiment confirmed Rorschach's and Oberholzer's claim of the usefulness of the Rorschach inkblot method in differentiating organic from functional psychoses. An organic disease of the central nervous system alters psychological reactions specifically, thus making the application of a purely psychological method such as the Rorschach especially fruitful. [10 min.]

Mental Sets in Schizophrenia Studied in a Discrimination Reaction Setting. DAVID SHAKOW, Worcester State Hospital.

During an earlier series of experiments on discrimination reaction time in schizophrenic and normal subjects it was found that there was apparently a greater tendency on the part of the schizophrenics to establish minor sets, *i.e.* to be influenced by the immediately preceding stimulus, as judged from lengthened reaction times. To determine the validity of this finding the present experiment was conducted by Malcolm Y. McCormick. Various arrangements of stimuli which would facilitate the establishment of minor sets in

different degrees were presented to twenty schizophrenic subjects, selected from the extremes of the distributions of a number of relevant physiological and psychological characteristics, and to ten normal subjects. The results are analyzed in relation to other findings on the patients and the implications for a theory of schizophrenia involving adaptation discussed. [15 min.]

Concept Formation Test in Schizophrenia. E. HANFMANN, Rhode Island State Hospital, and J. KASANIN, Michael Reese Hospital.

The present investigation had for its purpose to test Vigotsky's thesis according to which schizophrenic patients show an impairment of conceptual thinking, indicated especially clearly by disturbances in the process of formation of new concepts. To test this thesis Vigotsky-Saharov's variation of Ach's method was used. The subject is confronted with a number of blocks of varied shapes, colors and sizes, and has the task of finding the fourfold division that is indicated by nonsense words written on the bottoms of the blocks. After every attempt at classification one of the blocks is turned over by the examiner and the name revealed serves as a clue for further trials. The "correct" classification is based on a combination of two characteristics, so that in arriving at it the subject has to form certain artificial concepts. The performance is scored in terms of time and amount of help required for the solution; further evidence of the subject's level of thinking is obtained from a detailed analysis of his procedure in solving the problem. The results obtained on 60 patients and 90 normal controls clearly indicate the advantage of normal subjects over the schizophrenic patients and suggest that repression to a pre-conceptual level of thinking represents a prominent trait in certain cases of schizophrenia. [15 min.]

The Reaction of Schizophrenics to Interrupted Tasks. MARIA A. RICKERS-OVSIANKINA, Worcester State Hospital.

This study is part of a more extensive investigation which, on the basis of K. Lewin's theories, aims at a systematic formulation of the personality structure of schizophrenic individuals. The present experiment is concerned with one aspect of the problem: the ability of a person to form and sustain firmly segregated tension-systems. For this purpose the method of interrupting the subject in the performance of a "goal-determined" task was used. In a situation of this type normal individuals showed a strong tendency to complete

a task once started; 73% of the interrupted tasks being resumed and completed at the first opportunity. In contrast to this behavior schizophrenic subjects acted considerably less "goal-determined," the percentage of resumed and completed tasks being only 42%. Moreover, the patients repeatedly interrupted their activities of their own accord. Those patients who did finish the task frequently attained the completion only after several self-initiated interruptions. The conclusion is drawn that schizophrenics show a definite impediment in forming firmly segregated tension-systems. The theoretical implications of these findings are discussed. [15 min., slides.]

The Preferential Repetition of Successful and Unsuccessful Activities. SAUL ROSENZWEIG, Worcester State Hospital.

In previous experimentation with a group of crippled children who were given two easy jig-saw puzzles as a competitive test under such conditions that one of the tasks was successfully finished, the other interrupted as a failure before its completion, it was found that the younger children preferred to repeat the successful performance, the older children, the unsuccessful one. Higher mental ages and higher ratings on the trait of pride as assigned by the teachers of the children also characterized those choosing to repeat the unsuccessful task. One interpretation of these results is that an increase in intellectual capacity makes for a greater tendency to seek closures in performance. Another is that with increase in age comes an increase in pride and self-criticalness, entailing a certain sensitiveness to failure and leading to attempts at self-vindication. In keeping with this interpretation it would be said that the younger children were not wounded by their unsuccessful efforts because they lacked a sense of responsibility in relation to these activities; it would even be questionable whether one could say that they experienced failure at all.

Further studies on other groups of subjects have shed additional light upon the problem. Work with uncrippled *normal children* has not only confirmed the previous results but has served to delimit the more representative *lower age range* of the function under study. Experiments with *college undergraduates* have correspondingly explored the *upper age range*. With *feeble-minded subjects*, where it is possible within certain limits to vary chronological age while holding mental age constant, the importance of the *intellectual factor* in determining repetition-choice was studied. *Schizophrenic subjects*, in whom normal mental ages but abnormal personality variations are found, made possible the evaluation of the *dynamic factors* involved. [15 min.]

PROGRAM: HUMAN LEARNING II

FRIDAY, SEPTEMBER 4, 2:00 P.M.

105 DARTMOUTH

WALTER S. HUNTER, *Chairman*

A Natural Case of Transfer of Training in Handwriting from the Left Hand to the Right Hand. PAUL CAMPBELL YOUNG, Louisiana State University.

Desiring to keep his mind off his troubles and to substantiate the training-versus-endowment hypothesis, an accountant wrote and figured exclusively with his left hand for more than four months. Besides, he diligently practiced writing sinistrally. Thus he achieved an effortless, rounded, "copy-book" script, quite different from his former labored dextral "scribble" (*sic*). Suffering with sinistral fatigue one Sunday from prolonged practice, he began writing dextrally and, to his surprise, in a style even more fluent, more rounded, more "copy-book" in appearance than his sinistral writing.

The report includes photostatic copies of samples of the three styles of writing, all on one page; along with the subject's account of the sinistral learning process and his introspections upon this transfer of skill. His descriptions tend to confirm the configurational hypothesis. [10 min.]

Equivalence of Response in Learning. R. H. WATERS, University of Arkansas.

Numerous more or less scattered observations of what may be called equivalence of response appear in the psychological literature. The paper to be reported has three purposes: (1) To bring together these scattered observations; (2) to present new experimental evidence of the phenomenon; and (3) to emphasize the importance of the concept of equivalence of response for learning theory.

The experimental evidence presented for the first time includes three sets of data: (1) Photographs of the successive runs taken by rats in traveling up an inclined plane to the incentive; (2) photographs of the successive runs taken by rats through the correct branch of a simple T-maze; and (3) bilateral transfer data obtained in a study of human maze learning.

The photographic records agree with the data of other observers in showing that what the animal learns is not a single reaction or mode of solving a problem but rather that he acquires simultaneously the ability to utilize a number of equally effective modes of response. The data on bilateral transfer indicate a carry-over of approximately 80% to the untrained hand. It will be suggested that equivalence of response and bilateral transfer of training belong on the same continuum.

The significance of the concept of equivalence of response for descriptive theories of learning has not received due recognition. Particularly in the light of the concepts of equivalence of stimulation, the variability of nervous function, and equivalence of response, it seems evident that no definition of learning as the linking of specific responses to specific stimuli or as the development of specific or particular responses to specific or particular situations, can be accepted as valid. [15 min., slides.]

The Principles of a Maze Learning Machine. STEVENSON SMITH,
University of Washington.

The essentials of this machine are (1) a receptor mechanism that reacts to blind alleys, (2) an effector mechanism that provides locomotion and that, upon the machine's entering a blind, responds to the action of the receptor in a way that causes the machine to backtrack and then to resume its forward progress, (3) a conditioning mechanism that permanently alters the machine's directional tendency at choice points that precede blinds which have stimulated the effector in previous encounters, and (4) a mechanism which carries the conditioning device and which changes position relative to the machine's progress through the maze. All modifications that result from the machine's encounters are confined to the machine itself. The maze remains unchanged. Any of the 4,096 possible patterns of a maze of twelve Y units is learned in a single transversal. [10 min.]

Three Hypotheses Concerning Practice on Equivalent Tasks.
EDWARD B. GREENE, University of Michigan.

The three hypotheses are:

- (1) That an individual's score, expressed in amount-correct-per-time, has an inverse linear relation to the rate and to the errors, for tasks of one level of complexity, during a particular period of practice. This linear relationship does not hold for extremes of the scale.
- (2) That an individual's scores on two tasks which vary only in

a small degree of complexity or precision have a constant ratio to each other over wide periods of practice.

(3) That an individual's ratio between two such tasks has a direct linear relationship with his maximum scores in these tasks at the end of a long practice period.

In order to test these three hypotheses, 155 college students practiced aiming at 4 mm. and at $1\frac{1}{2}$ mm. circles three times a day for ten days, with each hand separately. The results confirmed the three hypotheses with considerable precision. Each person's scores showed a very definite schema between rate, accuracy, and amount of practice.

The results have a practical significance, since they indicate that a person's maximum performance at the end of a practice series can be accurately predicted at an early stage in practice. The results have a theoretical value in that they show a uniform relationship between acts of different complexity or motor precision. This relationship may be expressed as a law. Further studies are suggested to test these hypotheses in the fields of perceptual discrimination and problems requiring inferences. [15 min., slides.]

Factors in Improvement with Practice. HERBERT WOODROW, University of Illinois.

When goodness of test-score is regarded as dependent upon certain general and specific abilities (or factors), the problem arises of determining on what factors depends that part of the final score which constitutes the improvement resulting from practice.

Practice consisting of 39 sittings, each lasting 105 minutes and divided between 7 tests, was completed by 56 subjects. The tests practiced (each of which, with the exception of the speed test, was prepared in 10 different forms) were the following: horizontal adding, number-letter substitution, modified spot pattern, multiple instruction letter cancellation, speed in making gates, estimation of relative length of lines, and rearranging letters to make words. In order to obtain reliability coefficients in the neighborhood of +.95 for both initial and final scores, the scores made on the first five days were combined into one initial score and those made on the last three days into one final score.

A factorial analysis was made of the correlational matrix formed by the intercorrelations of all scores—initial, final and improvement scores in the practice tests and, in addition, the scores on numerous end tests, including intelligence tests.

No general improvement factor was present. In other words

there was no evidence of a general ability to improve with practice. The improvements were, however, by no means entirely dependent on the factor specific to the particular test practiced. By means of the factor analysis, there were isolated several abilities, other than intelligence. These abilities were found to show very decided correlations with improvement, each of them entering as an important common factor in some small sub-group of the seven improvement scores. [15 min., slides.]

The Effect on the Reliability of a Maze of Isolating the Pure Maze Factor. RICHARD LEDGERWOOD, Southeastern Teachers College, Durant, Oklahoma.

The problem involves the factorial partition of learning scores. A generalized form of the so-called two-factor theory is postulated. The question is raised, Why should increasing the length of a test increase its reliability? It is tentatively suggested that if a test be regarded as a *battery* of the items composing it, an increase in the number of items augments the factor common to them all and diminishes the relative importance of the specific and chance factors present in each. If a table of the intertrial correlations of performance scores is constructed and factor analysis applied, the determinants of performance at successive points in the course of learning can be isolated and fractional learning curves constructed by treating the factor loadings as weights and finding the products of the raw scores and these weights. In this manner the specific and chance factors can at once be eliminated and the same result obtained as by lengthening the test. If necessary several such "pure fractions" can be combined and what amounts to the communality products of the raw scores used for the purpose. An attempt is made to verify this reasoning by application to a variety of maze-learning data. These include data from two forms of a pencil maze with which human beings were used as subjects and several animal mazes of different lengths and difficulty. The results so far obtained seem to confirm the theory. A factorial definition of the validity of maze-performance scores is suggested, and evidence is found of both the greater reliability and the greater validity of time scores as compared with error scores. [15 min., slides.]

PROGRAM: EDUCATIONAL PSYCHOLOGY

SATURDAY, SEPTEMBER 5, 9:00 A.M.

14 SILSBY

M. E. HAGGERTY, *Chairman*

A Study of the Present Social Status of a Group of Adults Who, When They Were in Elementary Schools, Were Classified as Mentally Deficient. WARREN BALLER and D. A. WORCESTER, University of Nebraska.

The purpose of the study: to trace the careers of a particular group of individuals whose diagnoses of mental deficiency had been made prior to the social success or failure of later life, in order to determine (1) the relationship between antisocial conduct and mental deficiency, and (2) the extent to which the mentally subnormal can be economically self-supporting.

The procedure called for a detailed "follow-up" involving nine main lines of inquiry: home background; schooling; health; marital status; record of conduct; economic status; employment; the effects of the depression upon the mentally deficient; differentiating factors between the "successful" and the "unsuccessful" members of the group.

Records of thirty-five agencies and institutions were examined for pertinent data.

The subjects were two hundred and six men and women, now over twenty-one years of age, who were at one time enrolled in opportunity room classes of the Lincoln, Nebraska, Public Schools. Control subjects of normal intelligence were selected and "paired" with the subnormals in sex, age, and nationality.

The results of the investigation indicate that it is possible for many persons of subnormal intelligence to remain law-abiding and to become self-supporting. In this study 21% of the male subnormals were both law-abiding and wholly self-supporting, as were 30% of the subnormal women. Training for domestic responsibility and care of personal appearance were factors most conducive to successful adjustment among the women subjects; no consistently differentiating factors were found for the better adjusted males. The amount of supervision in school and after leaving school seems to be

related to the successful adjustment of the mentally deficient subjects.
[15 min.]

Abilities and Scholarship of High School Seniors in College and Non-College Cities. JAMES P. PORTER, Ohio University.

Two high schools in Ohio and one in Missouri constituted the experimental groups. One senior group in each state was used as the control. A control for one of the groups in an Ohio college city had to be omitted. Cities were paired as to size and following correspondence with persons acquainted with the localities.

One or the other of Forms 17 and 18 of the Ohio State University Psychological Examination was used as one measure of ability. The College Aptitude Test prepared by the Association of Minnesota Colleges gave us the other measure of ability. These tests were administered by local school officials or Mr. Leland W. Boord, a graduate student. Mr. James H. Burke has assisted the former in the statistical computations. Only grades in academic subjects were included in computing averages of scholastic success. Correlations between ability measures and average scholarship are somewhat higher than those reported earlier by others; the two tests agree almost as well as the Ohio test does with itself; the rank-difference method and the Pearson r method give findings closely comparable.

The senior pupils in college cities appear to be working more in accordance with their abilities as measured. The Ohio test is a slightly better differentiating instrument than the Minnesota, within the group definitely intending to go to college. With the exception of city E in Ohio no significant differences were found in the ability of students in college and non-college cities. The determination of other differences—social, emotional and attitudinal—is contemplated.
[15 min., slides.]

The Effect upon Student Achievement in Psychology of Weekly Examinations and of Stress upon Improvement. ALVIN C. EURICH, University of Minnesota.

The purpose of this experiment was to determine the extent to which weekly examinations and emphasis upon improvement rather than final achievement motivate students in their study of psychology. The subjects were registered in Practical Applications in Psychology, a course offered in the General College of the University of Minnesota. The instructor, Dr. Howard P. Longstaff, collaborated throughout the investigation.

Sixty-three students comprised the experimental group. They were registered during the spring term of 1935 when initial, weekly and final tests were administered. Throughout the quarter emphasis was placed upon gains and the students were requested to chart their progress. The experimental group were matched individually on the basis of College Ability Test ratings and initial scores with members of a control group, who, while registered in the fall of 1935, took only the initial and final tests. Throughout the quarter final achievement rather than progress was stressed.

No significant difference between the two groups was found in final achievement or in the amount of improvement during the quarter. Furthermore, the effect of weekly tests was the same for students at the extremes of the distributions as for the entire groups. An analysis of the initial scores in terms of their predictive value for final achievement shows that students with high initial scores made small absolute gains but large relative gains; whereas, students with low initial scores made large absolute gains but small relative gains. It was found further that changes in beliefs or attitudes while studying psychology are not as permanent as the retention of information. [15 min.]

The Use of Tests and Statistical Analyses as a Basis for Curriculum Revision. L. J. O'ROURKE, The Psychological Institute, Washington, D. C.

A study of English usage was made on the basis of one and one-half million cases, with records over a five-year period. Forty thousand teachers coöperated in the program, which was conducted under a grant from The Carnegie Foundation for the Advancement of Teaching.

Records are based upon ten different tests. Nation-wide grade norms established for each test indicate the degree of progress made from grade to grade. Progress in mastery from grade to grade was also determined for each individual principle of usage. The nation-wide study showed that, because of the difficulty of least essential points of usage, only a negligible degree of mastery of such points is attained, although teachers devote a great amount of time to these points. Records for the country as a whole show, for the seventh grade, only 34.7% mastery of essentials, 23% mastery of niceties, and 11.8% mastery of least important points of usage.

On the basis of test records, combined with teachers' ratings * as to the importance of each principle of usage, a sequence for the

* Statistical analysis of these ratings will be explained.

introduction of principles has been developed as a guide for curriculum revision. It insures the introduction of points of usage in an order consistent with pupils' needs and abilities.

The National Council of Teachers of English in its current report on curriculum revision has recommended the revision of elementary curriculums in accordance with the findings of this study.

A number of special techniques developed for the purpose of increasing mastery of usage will be discussed, among them a method which effectively carries over into everyday life the habits of correct usage established in the English class. [15 min.]

Causes of Failure in Reading. ARTHUR I. GATES, Teachers College, Columbia University.

The evidence to be presented was obtained from the following sources: (1) The New York City Remedial Reading project in which 500 or more W.P.A. workers have been engaged since January, 1934, and in which over 12,000 pupils have been studied; (2) more intensive studies of several groups of reading disabilities; (3) intensive studies of several groups of children during the first year of reading experience, and (4) examinations of miscellaneous small groups.

Data will be presented concerning the relationship to reading disability of: (1) various sensory defects; (2) intelligence; (3) phonetic inaptitude; (4) lateral dominance of eye and hand and lack of it; (5) defective mental processes; (6) deficiencies in personality and temperament; (7) unfavorable preschool conditions; (8) beginning reading too early; (9) unfortunate classroom conditions; (10) inadequate teaching material and techniques, etc. In general, the data from the various sources agree well in attributing great importance to factors (2), (9) and (10), considerable importance to (1), (3), and (6), some to (5), (7), and very little to (4) and (8). The impressive rôle of combinations of defects or limitations will be stressed. Types of psychological study and examination needed for every child entering school and some suggestions concerning the relation of the psychologists and teachers will be offered. [15 min.]

Differential Effect of Age and Experience on Mental Abilities. HERBERT SORENSEN, University of Minnesota.

The data for this paper were obtained by measuring the mental abilities of various groups of several hundred adults by means of

general aptitude or intelligence tests. Analysis of the test results indicates that the older adults are relatively poorer than younger adults in some abilities but are better in others. It appears that some abilities increase with age, while others decline. There are also those abilities which show little upward or downward trend with age.

These investigations do not purport to indicate whether ability increases, decreases or remains constant with age. It is difficult to draw such conclusions when the degree of selection of adults throughout the age range is unknown.

The data do show, however, that age and experience have a differential effect on abilities. Some increase while others decrease. The findings also stimulate one to inquire whether or not most investigators of adult abilities and capacities have not failed to differentiate ability from capacity. Decline in ability has been interpreted as indicating a decrease in sheer capacity or basic intelligence. The data to be described and discussed in this paper cause one to suspect that such reasoning is highly fallacious. The various abilities measured by the typical intelligence tests increase or decline to a considerable extent as a consequence of adult opportunity and experience. Such trends do not, however, necessarily indicate either growth or decline of basic capacity. [15 min.]

PROGRAM: ANIMAL PSYCHOLOGY II

SATURDAY, SEPTEMBER 5, 9:00 A.M.

105 DARTMOUTH

ROBERT M. YERKES, *Chairman*

Effect of Vibrato Stimulation on Natural Songs of Roller Canaries.

MILTON METFESSEL, University of Southern California.

As reported to the Association last year, the vibrato is not a part of the natural song of roller canaries reared in sound-proof cages. In the roller-canary project this past year, two males in sound-proof cages have been stimulated with a standardized vibrato on a phonograph record, and nothing else.

The natural rolls and tours appeared just as under non-stimulated conditions. As time went on, the attempt to produce the vibrato was made from the natural effects which had similar characteristics. Typical natural schockel, for example, has a variation

of a half-step at a rate of seven times per second just as the stimulating vibrato has, but its separate patterns are discrete, whereas the vibrato patterns are contiguous. Certain schockel patterns have become more contiguous under vibrato stimulation, although the schockel in its natural form is still produced.

Not only has the vibrato become a part of the song of the birds, but the natural song shows a convergence upon vibrato as a dominant factor. New rolls and tours have appeared in the relating of the natural effects with the trained vibrato. For instance, a trill, not in the natural song and distinct from vibrato, has been integrated into one roller's daily song.

The vibrato training did not inhibit any important natural effect in the sense of completely eliminating it from the song, although some effects appear less frequently in the vibrato-trained song than in the natural song. Those similar to the vibrato, which are minor in the natural song, appear prominently in the taught song.

The significance of goal-less ("blind," untaught from external sources) performance in isolated rollers as contrasted with goal-learning in vibrato-stimulated rollers is open to theorizing. [15 min., slides.]

The Relation Between Fear and Withdrawal Behavior in Dogs.

(From the Anatomy Department, Cornell Medical College.)

FREDERICK C. THORNE, Hunter College.

A selected group of 178 dogs representing 14 pure-bred and 19 hybrid types were tested under controlled conditions by simple observational techniques to determine their friendliness. When first observed, many dogs were wild in that they had not been handled. Quantitative results were obtained by measuring the closeness of approach of each animal to the experimenter in three situations involving graded emotional adjustments of the dogs. After a thirty day taming period, every animal was ranked according to maximum friendliness shown. Although many dogs improved their rankings as the experiment continued, only 54% of them received ranking as completely friendly. All degrees of withdrawal behavior were observed in the refractory animals. The negative behavior was not altered by offering more attractive rewards. Transfer experiments show that friendliness is specific to a given situation; the improvements noted were not carried over to strangers.

The group of incompletely friendly animals was subjected to further experimentation in which forceful procedures were adopted.

Negative animals were caught and forced to submit to handling over a 30 day period. The animals immediately divided themselves into two groups, one becoming completely inhibited and the other showing a wild manic response. The inhibitory animals showed a tendency to improve under this treatment and 50% of them eventually attained a completely friendly ranking. The dogs showing the manic response showed no tendency to improve and many of them became progressively more unfriendly. The degrees of fear involved were roughly estimated according to failure to eat, urination, defecation or vomiting occurring during the experiment. Study of genetic relationships indicates that the fear reactions reported are characteristic of family groups rather than breeds. [15 min.]

Competitive Behavior in Rats. WILLIAM M. LEPLEY, The Pennsylvania State College.

The experiment to be reported was planned and executed in an attempt to answer the question: can rats be induced to exhibit behavior analogous to that which is loosely called *competitive* with reference to human behavior?

Twelve litter mates, six males and six females were run in a straight thirty-foot alley with a food goal. Timing was semi-automatic. The successive experimental procedures were as follows:

1. Each rat was given twenty, manually guided, untimed, rewarded runs in isolation (four runs per day).
2. Each rat was given eighty unguided, untimed, rewarded runs in isolation (four runs per day).
3. Each rat was given forty unguided, timed, rewarded runs in isolation (four runs per day).
4. Upon the basis of the mean time scores obtained in 3, the rats were then matched and paired within each sex group. These pairs were then given forty unguided, timed rewarded runs *in pairs* (four runs per day).
5. These pairs were then given forty additional unguided, timed runs (four runs per day). In these forty runs only the winning rat in each run, that is to say, only the rat first attaining the goal box, was rewarded.

The results from procedure 3 show that the group had been trained to a speed of locomotion plateau. The data from procedure 4 appear to show that the interstimulation resulting from running in pairs was adequate to produce a significant increase in speed of locomotion. The data gathered by procedure 5 reveal no evidence

of a discrimination between the pre-goal winning situation and the pre-goal losing situation. Interpretations and further experiments are to be suggested. [15 min.]

Further Study of Coöperative Behavior in Chimpanzee. MEREDITH P. CRAWFORD, Yale University.

Young chimpanzees were trained in pairs to solve problems requiring teamwork or coöperation. The pulling in of a heavy box baited with food by two ropes was chosen for detailed study. The apparatus was controlled entirely from an observation booth where the experimenter was concealed from the subjects during an entire experimental session. Records consisted of verbal descriptions dictated while watching the animals, automatic recordings of amount and duration of pulls on the ropes, and moving picture films. The coöperative activity did not appear spontaneously, but was subject to training and developed through three stages. (1) The animals pulled together by responding simultaneously to an external cue. (2) Each animal learned to watch its partner and to join its pulling at the proper time. (3) Two of the chimpanzees developed gestures by which they solicited their partners' pulling. The gestures consisted in arm and hand movements, sometimes accompanied by vocalizations, specifically adapted to the needs of the situation. An animal was thus enabled to induce its partner to begin pulling, or to recall it to the task when its interest lagged. The animals which did any soliciting at all solicited every partner with whom they were paired, apparently having developed solicitation as a generalized method of problem solution. Animals who solicited sometimes did considerably less work than the partner whom they solicited. Those who learned to use gestures for solicitation in the pull-in-box problem also solicited in other problems requiring teamwork. Interesting consistencies in amount and style of pulling by individual animals when paired with different partners were discovered on analysis of graphic records. [15 min., slides.]

The Interrelationship of Drives in the Male Albino Rat. E. E. ANDERSON, Harvard University.

Problem: To determine the intercorrelations between various measures of 'drive.'

Method: A group of 51 male rats was given 44 different tests. Six tests were measures of learning, the majority of the remainder

were tests of 'drive' strength. Hunger, thirst, sex and exploratory activity were each measured by several different tests, 'emotion' and general activity by one test each.

Results: (1) The majority of the tests yielded reliabilities ranging from .85 to .98.

(2) If the same apparatus and method are used for different drives, the intercorrelations are usually significant.

(3) When the same drive is measured by several different methods, significant intercorrelations may or may not be obtained. (a) Six exploratory tests yield intercorrelations of .28 to .64. (b) Seven sex tests yield correlations of .15 to .69, only 3 of the 21 r's being under .37. The interpretation of these results as indicating the existence of a more or less unitary sex drive is complicated by the fact that these tests also show fairly consistent correlations with measures of other drives and by consideration of the order of testing. (c) Hunger tests do not show consistent intercorrelations, nor do tests of thirst. Intercorrelations involving these drives appear to be due more to special aptitudes upon certain types of test, rather than to differences in the strength of drive.

(4) Emotion as measured by defecation in a novel situation shows consistent, but low, negative correlations with the majority of the tests used. The highest correlations (around -.40) for this test were with the sex and learning measures.

(5) Two tests which correlate but slightly or not at all upon the first application may correlate significantly after several repetitions. [15 min.]

Periodicity of Sexual Behavior in Chimpanzee. JAMES H. ELDER,
Yale Laboratories of Primate Biology.

Sixteen chimpanzees representing various stages of sexual maturity were observed in more than 500 experimental matings for the purpose of determining the relations between oestrus and various other conditions. Of primary interest was the periodicity of receptivity in the female, the consequent effect upon the male, and the relation of this behavior to the sexual status of the female.

Matings involving a given pair of animals ordinarily produced results which were consistent and predictable. Likewise, the behavior of an individual male with various females showed a high correlation with the sexual status of the female. Comparing these results with those of Hartman and Ball, there appears to be a greater variability in chimpanzees than in monkeys. Some males show a marked ability to discriminate slight differences in the female while

others are less selective, responding without regard to the day of cycle or sexual status.

These observations suggest tentatively that previous reports to the effect that copulation in chimpanzee occurs throughout the sexual cycle irrespective of temporal phase or physiological status of the female inaccurately represent the facts for the genus *Pan*. Observations reported here provide some possible explanations for the discrepancies which have appeared.

On the other hand, the present information does not indicate periodicity of clearly defined limits for all subjects. The reason for this, aside from certain defects in observational technique, appears to lie in the complexity of factors determining sexual behavior. All the evidence obtained thus far indicates that sociological, environmental, and physiological conditions affecting the sexual response of chimpanzee are much more numerous than in the lower mammals. The response of male and female to each other involves subtleties of behavior which are not thoroughly understood and demand extended study before the behavior can be interpreted satisfactorily. [15 min., slides.]

Sexual Responsiveness in Female Monkeys After Castration and Subsequent Estrin Administration. JOSEPHINE BALL, Johns Hopkins Medical School.

Nine female rhesus monkeys were used for this study. The measurement of sexual receptivity was based on the animals' response to males in several 10-min. mating tests given three times a week over extended periods of time. Most of the animals were observed continuously, except for the hot summer months, for two or three years. Four of them were tested throughout several normal menstrual cycles before castration.

After castration sex interest drops, over varying periods of time, to practically zero.

Injection of estrogenic hormones (Progynon B, Schering and Amniotin, Squibb) raises it to normal.

There seems to be a slight tendency to periodicity after removal of the ovaries. Before this was taken into consideration there was little relation between hormone dosage and amount of reaction. By administering the hormone at monthly intervals this relationship has been improved. The discrepancies encountered on this regime are consistent with the observation of Engle and Hartman that the summer (non-breeding) season reduces response to sex hormones. [15 min., slides.]

PROGRAM: WORK AND FATIGUE

SATURDAY, SEPTEMBER 5, 9:30 A.M.

13 CARPENTER

CHARLES LEONARD STONE, *Chairman**The Effect of Functional Periodicity on the Learning Process.*ORPHA MAUST LOUGH, Mills Training School for Kindergarten
and Primary Teachers, 66 Fifth Avenue, New York, N. Y.

The purpose of this study was to ascertain what influence functional periodicity has on women's mental efficiency as shown by the learning process. The subjects were ninety-six unmarried, college women between the ages of seventeen and twenty-four.

The quantitative data were delimited to scores on (1) daily five-minute learning tests, (2) Thurstone Personality Schedule, Clark Revision, (3) Henmon-Nelson Tests of Mental Ability, Form A (given between menstrual periods) and Form B (given during menstruation). The learning tests were administered on thirty-two consecutive school days to sixty-five students, and forty school days to thirty-one students. The qualitative data were delimited to attributes (1) of certain remembered mental and physical habits, and (2) of emotional disturbance, pain, and worry recorded daily. The subjects were naïve as to the true nature of the experiment. Daily graphic records of each subject's performance provided motivation. The quantitative and qualitative data were grouped for each subject according to the four phases of the menstrual cycle and analyzed statistically.

The results were: (1) learning progresses during the four phases of the menstrual cycle with no statistically demonstrable differences; (2) functional periodicity has no demonstrable effect upon intelligence or upon neurotic tendencies; (3) mental activities which require only speed are not affected by gynaecological periods; (4) number of equations incorrectly completed varies on specific days in the menstrual cycle; (5) although, as given from memory, there is only slight relationship between qualitative variables and physiological periodicity, the relationship of attributes varies widely on specific days of the menstrual cycle; (6) the relationship is slight between the number of equations completed daily and the attributes;

(7) mental efficiency, as measured by correct responses, is not affected in subjects of this age and occupation. [15 min.]

The Optimal Locus of Facilitatory Tension in Muscular Work. G. L. FREEMAN, Northwestern University.

Current research indicates much confusion regarding the effects of muscle tension on performance. The present experiment studied the locus of anticipatory tension as one factor entering into the equation. Subjects performed finger oscillations with right or left biceps or triceps sustaining various weights. Results indicate that different loads affect optimal facilitation of the test performance when acting from different muscle groups. To eliminate complicating central factors, such as attentional shifts in a bifurcate task, subjects again performed finger oscillations, but with ipsilateral or contralateral muscles contracting in response to faradic stimulation of their motor points. Optimal facilitation is produced by anticipatory contraction in muscle groups most closely associated with the reacting member. Novocaine nerve-block abolishes facilitative effects of contraction developed in associated muscles, indicating the importance of proprioceptive pathways. The relation of these results to principles of spinal irradiation is discussed. [10 min., slides.]

Output of Muscular Action Potentials and Output of Mental Work. R. C. DAVIS, Indiana University.

For any motor theory of psychological processes the determination of the exact relation between muscular activity and mental work done is of decisive importance. The writer takes it as a rather well established generalization that psychological activity of any nature and any degree is accompanied by disturbance in every somatic system. A series of experiments on the intimacy of that relationship is here reported. The first study in this series (published by M. S. Clites) showed a distinct positive relation between increase in muscular action potential and success in the solution of a certain problem. Subsequent experiments, using approximately 45 subjects in a group used the same procedure for the study of other tasks. With subjects trying to learn a poetic passage there was a reliable negative relation between increase in action potentials and amount learned, measured by both words and meaning. A group of subjects working at serial addition showed no relation between accomplishment and increase of action potentials. When subjects worked at long multiplication the negative relation again

appeared, with time as a measure, and also with accuracy. It is clear that there is no general relation between amount of increase in action potentials and output of work, though relationships exist for specific cases and call for explanation. The factors of ability, practice, difficulty, and distraction are suggested as variables which need to be taken into account along with output of work. As the chief difference in the several types of work seems to be in applicability of previous experience, the factor of practice is probably most important in accounting for the differences found. To investigate further the factors mentioned series of measurements have been taken on the same individuals, calculation of results being incomplete at the time of writing. [15 min., slides.]

A Comparative Study of Mental Fatigue and Anoxemia. ARTHUR G. BILLS, University of Chicago.

Because mental fatigue is characterized by an increase in the frequency and length of blocks occurring in continuous association, and because one theory of mental fatigue relates it to a depletion of the oxygen supply in the higher nerve centers, this investigation was made to get a comparative picture of the results of anoxemia, where oxygen deprivation is artificially induced, and of mental fatigue from continuous performance. Anoxemia was produced by having the subjects inspire, one hour continuously, from a large bag in which nitrogen and air were mixed in varying proportions, to give percentages of oxygen ranging from 12 to 9, as compared with the 20.9% in normal air. Performance was registered on the author's psychergometer. The results show a striking resemblance between the fatigue effects and those from oxygen deprivation. [10 min., slides.]

Blocking in Mental and Motor Tasks During a 65 Hour Vigil. NEIL WARREN and BRANT CLARK, University of Southern California.

Results of tests during prolonged sleeplessness have been largely negative due, apparently, to a tendency on the part of the subjects to compensate by increasing effort. The present report is concerned with one of a number of measures intended to minimize the factor of compensation; measures including tests of visual coördinations, irritability, etc., in which voluntary control is less significant, and tests of "blocking" in continuous mental and motor tasks, sufficiently prolonged to diminish the probability of compensation.

The method of indicating mental fatigue by recording "blocks,"

as used by Bills, was adapted for the present series of tests. Subjects were tested on alternate addition and subtraction, on color naming, and on finger tapping. A "block" was defined as a period of failure to respond, equal to at least twice the modal response time. Each of four subjects was tested at 10 hour intervals during a period of 65 hours of sleeplessness.

In addition and subtraction and in color naming tests an increase in number of "blocks" was noted, reaching a peak after about 48 hours of sleeplessness. The average time of response did not change significantly during the test period. During the last 17 hours a decrease in number of "blocks" was observed in two subjects with the final number remaining well above the control level. There was considerable fluctuation of response in successive performances by each subject. While "blocks" in tapping were recorded there was no significantly greater frequency after loss of sleep. [15 min.]

The Effect of Suggested Attitudes on Work Production and Feelings of Tiredness and Boredness. JAMES H. TAYLOR, Wittenberg College, Springfield, Ohio.

Problem: To determine effects of various attitudes suggested in somnambulistic trance and waking state, in individual and group situations, on work production and feelings of tiredness and boredom.

Procedure: Ninety S's worked continuously for four hours on a production problem involving conduction of small metal slugs through a simple maze pathway, designed to prevent automatic performance. Records were kept of number of slugs produced per 15-minute period, subjects' self-rating of tiredness and boredom, and experimenters' rating of subjects' observable fatigue and attitude.

Typical findings: In the normal group situation, production increased constantly throughout the work period, while reports of tiredness and boredom showed constant decrement. Support is found for Lewin's concept of "psychic satiation." In contrast to Allport's findings, normal S's working alone produced more, reported less tiredness and boredom than did normal S's working in a group. Hypnotized S's, working in a group, produced about the same, reported almost the same feelings as did normal S's. S's paid a bonus, and S's allowed a regular rest, produced significantly more, but reported about the same decrement in feeling, as did normal S's. Normal S's working individually under suggestions of no fatigue produced far more than did S's working under suggestions of

extreme fatigue, and also showed significantly less decrement in feelings of tiredness and boredom. The same observation in respect to production holds for somnambules, but they reported far less decrement in tiredness and boredom. Typical tentative conclusions: Physiological fatigue is rarely encountered in the psychological laboratory. Feelings of tiredness and boredom are largely determined by preexperimental attitudes rather than by the nature of the work itself. (Credit to C. E. Thompson and D. Spassoff for obtaining and treating much of the data.) [15 min., slides.]

